Nos. 23-2296, 23-2297

In The
United States Court of Appeals
for the Federal Circuit

PARUS HOLDINGS, INC,

Appellant,

v.

GOOGLE LLC,

Appellee.

Appeals from the United States Patent and Trademark Office,
Patent Trial and Appeal Board in Nos. IPR2022-00358 and IPR2022-00523.

BRIEF FOR PARUS HOLDINGS, INC.

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December 8, 2023

U.S. Patent No. 7,881,941 B2 (the '941 patent)

(Claim 1 treated as representative.)

1. A method for retrieving information from pre-selected web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:

providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;

providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;

providing at least one instruction set stored in a database operatively connected to said computer, said instruction set comprising:

> a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;

providing a speech command to said speaker-independent speech recognition engine, said speech command corresponding to said instruction set;

said speaker-independent speech recognition engine assigning said speech command to a recognition grammar, said speech command and said recognition grammar corresponding to said instruction set;

transmitting said speech command to said speaker-independent speech recognition engine;

said speaker-independent speech recognition engine receiving said speech command and selecting the corresponding recognition grammar upon receiving said speech command;

said computer retrieving said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition engine;

said computer accessing at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer first accessing said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;

said speech synthesis engine producing an audio message containing any retrieved information from said pre-selected web sites; and

said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

U.S. Patent No. 8,185,402 B2 (the '402 patent)

(Claim 1 treated as representative; claim 2 relevant to argument.)

1. A method for retrieving information from web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:

providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;

providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;

providing a speech command to said speaker-independent speech recognition engine;

said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved, said computer first accessing a first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;

said speech synthesis engine producing an audio message containing any retrieved information from said web sites; and

said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

2. The method of claim 1 wherein said speech command is further associated with a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CERTIFICATE OF INTEREST

Case Number	23-2296, 23-2297
Short Case Caption	Parus Holdings, Inc. v. Google LLC
Filing Party/Entity	Parus Holdings, Inc.

Instructions:

1. Complete each section of the form and select none or N/A if appropriate.
2. Please enter only one item per box; attach additional pages as needed, and check the box to indicate such pages are attached.
3. In answering Sections 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance.
4. Please do not duplicate entries within Section 5.
5. Counsel must file amended Certificate of Interest within seven days after any information on this form changes. Fed. Cir. R. 47.4(c).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

Signature: /s/ *Joel L. Thollander*

Name: Joel L. Thollander

1. Represented Entities. Fed. Cir. R. 47.4(a)(1).	**2. Real Party in Interest.** Fed. Cir. R. 47.4(a)(2).	**3. Parent Corporations and Stockholders.** Fed. Cir. R. 47.4(a)(3).
Provide the full names of all entities represented by undersigned counsel in this case.	Provide the full names of all real parties in interest for the entities. Do not list the real parties if they are the same as the entities. ☒ None/Not Applicable	Provide the full names of all parent corporations for the entities and all publicly held companies that own 10% or more stock in the entities. ☒ None/Not Applicable
Parus Holdings, Inc.		

☐ ADDITIONAL PAGES ATTACHED

4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

☐ None/Not Applicable ☐ Additional pages attached

McKool Smith, P.C.	Ari Rafilson

5. Related Cases. Other than the originating case(s) for this case, are there related or prior cases that meet the criteria under Fed. Cir. R. 47.5(a)?

☒ Yes (file separate notice; see below) ☐ No ☐ N/A (amicus/movant)

If yes, concurrently file a separate Notice of Related Case Information that complies with Fed. Cir. R. 47.5(b). **Please do not duplicate information.** This separate Notice must only be filed with the first Certificate of Interest or, subsequently, if information changes during the pendency of the appeal. Fed. Cir. R. 47.5(b).

6. Organizational Victims and Bankruptcy Cases. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

☒ None/Not Applicable ☐ Additional pages attached

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STATEMENT OF RELATED CASES

Pursuant to FED. CIR. R. 47.5, Appellant Parus Holdings, Inc. (Parus) provides as follows:

(a) There have been no other previous appeals in these cases; and

(b) The following case is related and may be directly affected by this Court's decision in the pending consolidated appeals:

- *Parus Holdings, Inc. v. Google LLC*, No. 5:22-cv-7830 (N.D. Cal.).

STATEMENT OF JURISDICTION

On August 1, 2023, the Patent Trial and Appeal Board (the Board) issued its final written decisions in IPR2022-00358 and IPR2022-00523. Appx1, Appx39; 35 U.S.C. §§ 311, 318. The Board found claims 1-15 of U.S. Patent No. 7,881,941 B2 (the '941 patent) unpatentable as obvious under 35 U.S.C. § 103 in IPR 2022-00358, Appx36-37, and it found claims 1-15 of U.S. Patent No. 8,185,402 B2 (the '402 patent) unpatentable as obvious under 35 U.S.C. § 103 in IPR 2022-00523, Appx75-76. On August 10, 2023, Parus timely filed its notices of appeal in this Court. Appx818-821, Appx6238-6244; Dkt. Nos. 1-2; 37 C.F.R. § 90.3(a)(1); 35 U.S.C. § 142; FED. CIR. R. 15(a)(1). The Court consolidated the appeals, Dkt. No. 3, and has exclusive jurisdiction over them, 35 U.S.C. § 141(c).

STATEMENT OF THE ISSUES

Whether the Board erred in determining that Google met its burden to prove the challenged claims unpatentable as obvious when that determination rested on:

(1) reading claim language that recites "said *computer* sequentially accessing" as if, in effect, it recited "said *users* sequentially accessing"—where the claims distinguish actions taken by "said *computer*" from those taken by "said *users*";

(2) finding that a prior art reference disclosed the recited "plurality of pre-selected web addresses" containing the same "information to be retrieved"—where that reference distinguishes between a *singular* address and *plural* addresses, and teaches only a *singular* pre-selected address containing the information to be retrieved; and

(3) finding that a prior art reference's use of HTML tags disclosed the recited "content descriptor," which must be associated with a speech command, a web site address, and a pre-defined portion of a web site containing the information to be retrieved—where HTML tags satisfy none of those requirements.

STATEMENT OF THE CASE

I. Preliminary Statement.

Parus is an early pioneer of voice-response technology, and among its impactful contributions to the field are the '941 and '402 patents. These patents disclose and recite inventions permitting fast, flexible, and efficient access to Internet information using voice-enabled devices. In finding the challenged claims of the '941 and '402 patents unpatentable under 35 U.S.C. § 103 in the respective IPRs (consolidated here for appeal), the Board committed critical—and rather striking—errors with respect to three separate claim limitations.

1. The claims of both patents distinguish between the "users" and the "computer" in the recited methods and systems. The "users" provide a speech command that identifies information to be retrieved from web sites at the beginning of the process, and they receive an audio message transmission containing any information retrieved from the web sites at the end of the process. In the middle, the "computer" does the work: among other things, "said computer sequentially access[es] said plurality of web sites until said information is found or until said plurality of web sites has been accessed." Appx95, Appx116. Notwithstanding the express recitation that "said computer" performs the sequential accessing, the Board found that a *user*-iterated search disclosed in the prior art met this limitation. To do so, the Board treated the dispute between the parties as effectively raising an issue

of claim construction, and concluded that Parus' argument—that "said computer sequentially accessing" meant "said computer sequentially accessing"—improperly imported "an unclaimed negative limitation unsupported by the plain and ordinary meaning of the claim language and the specification." Appx62. That was error.

2. The claims of the '941 patent further recite "a plurality of pre-selected web addresses, each said web site address identifying a web site containing said information to be retrieved." Appx95. The Board found this limitation disclosed by a reference that clearly and repeatedly distinguishes between a *singular* address and *plural* addresses, and teaches only a *singular* pre-selected address containing the information to be retrieved. Furthermore, the Board's finding on this limitation rested in significant part upon a snippet of cross-examination testimony from Google's expert that: (a) was not offered in Google's petition nor the declarations that accompanied it; (b) was based on speculation rather than any express disclosure in the prior art reference at issue; and (c) Google's expert disclaimed reliance on in a later declaration. The Board's finding on this limitation was also error.

3. Finally, certain claims of the '402 patent recite a "content descriptor" associated with the speech command as well as with "each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved." Appx116. The Board found this limitation disclosed by a discussion of using HTML tags to navigate within a downloaded web page in one

of the prior art references at issue. The prior art reference, however, did not teach any kind of "association" between navigational tags and web site addresses, speech commands, or pre-defined areas containing the information to be retrieved.

Nevertheless, the Board found the limitation satisfied based principally on a hypothetical thought experiment offered in the reply declaration of Google's expert. The expert hypothesized that, if a speech command requesting information on "today's stocks" were used to select a web site, and some text "designating stock symbol links" were subsequently used to navigate within that web page, then there would be an "association" between the speech command and some HTML tag. In fact, this hypothesis shows little more than the possibility of a coincidental thematic overlap with some hypothetical *text*. It does not show an association with any *tag*—which was the theory offered in Google's petition. Nothing in the record shows, and the prior art reference does not teach, any systemic "association" between some navigational tag and the web site address, the speech command, and some pre-defined area containing the information to be retrieved. The Board's finding that navigational tags met the recited "content descriptor" was thus also error.

This Court should reverse.

II. Background.

A. The Parties.

Parus has a twenty-five year history of developing and offering innovative voice-driven products to help businesses of all sizes streamline and simplify their communications. Current product offerings include ParusOne, ParusOffice, ParusSpeak, and ParusMobile products. ParusOne is a voice-enabled assistant and virtual office providing voice-response technology solutions for customers to manage communication technology for business, including laptops, mobile phones, and home offices, to answer calls, handle voice mails, faxes and emails, schedule meetings, and establish conference calls. ParusOffice enables small businesses to channel their various phone communications through one main number. ParusOffice combines the power of ParusOne unified communications with a small office multi-extension system. ParusSpeak provides interactive voice response solutions for companies that need business process automation, as well as automated name, address, and caller feedback capture. ParusMobile provides worldwide group messaging for direct selling organizations, professionals, and small businesses.

Parus is a pioneer in its field, and its systems have received numerous industry accolades, including preeminent awards in the CRM, call center, and teleservice fields. ParusOne, for example, was named the 2007 Product of the Year by Internet

Telephony and Unified Communications. Parus has invested over $125 million in its innovations and continues to invest in advancing the technology today.

Google is an industry giant who makes use of the voice-enabled technology developed and patented by Parus, and who filed these petitions for *inter partes* review (IPR) on claims 1-15 of each of the '941 and '402 patents.

B. The Technology.

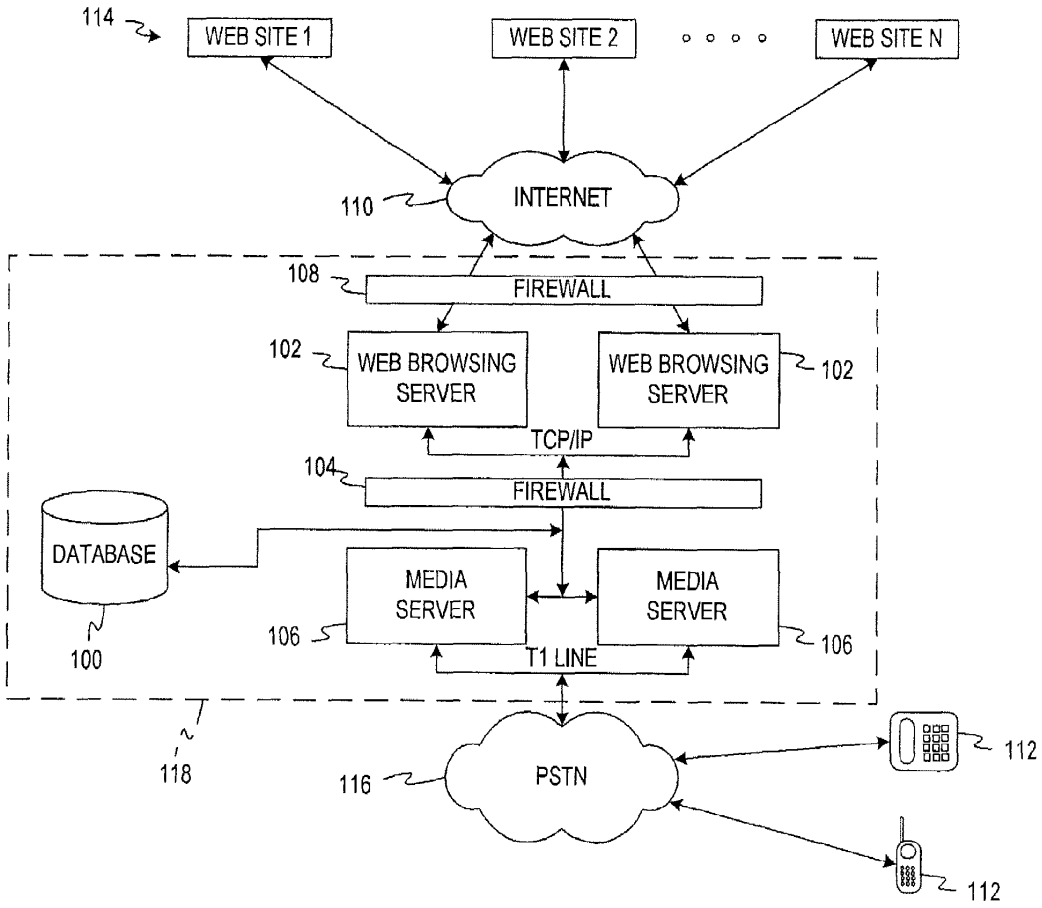
Parus began developing its voice-response systems in the mid-1990s. In developing these systems, still in use today, the inventors at Parus foresaw the power and promise in combining fast and flexible access to web sites and other networked devices with a speaker-independent speech recognition device designed to process any user's verbalized request. Appx86, Appx105. The '941 and '402 patents—related as continuations and sharing substantially similar specifications—are directed to new methods and systems for acquiring information from sources on a network, such as web sites, using speech commands. Appx78, Appx97.

In the mid-1990s, portable options for users needing to gather information from a web site accessible over the Internet were limited, and each option had distinct drawbacks. Appx86 (1:30-44), Appx105 (1:35-46). These options included: (1) heavy laptop computers with limited access to power and communication lines; (2) expensive personal digital assistants (PDAs), which required expensive service plans and could only access the minority of web sites designed to be PDA-

compatible; and (3) web-phones or web-pagers that suffered similar drawbacks. Appx86 (1:41-2:24), Appx105 (1:47-2:27).

The inventors at Parus were able to overcome the drawbacks of these prior art systems with "a robust and highly reliable system that allows users to browse web sites and retrieve information by using conversational voice commands," where the retrieved information is "converted into an audio message [and] transmitted to the user's voice enable device." Appx86 (1:20-26), Appx87 (3:41-56), Appx105 (1:24-28) ("a browsing system and method that allows users to browse web sites using conversational voice commands spoken into any type of voice enabled device").

The '941 and '402 patents disclose methods and systems that allow users access to Internet information using voice-enabled devices. Figure 1 demonstrates several novel aspects in a particular embodiment:



Appx82 (Fig. 1), Appx101 (Fig. 1). Users initially interact with a media server using naturally spoken, conversational voice commands via a handheld, voice-enabled device. The system then accesses various Internet web sites determined to be of interest to a user's query. In this capacity, a web browsing server accesses a web site relevant to a user voice command and receives a response. A database maintains information used in the systems' operations. Appx82, Appx101, Appx5103-5106, Appx7281-7284. The media server retrieves a record from the database relating to a user's speech command. This record, with other information, is used by the media

server to invoke the content extraction agent, which in turn uses the URL, the content fetcher, and the content descriptor file to orchestrate proper formatting of the web site requests and to process the resulting responses. Appx89 (7:8-28), Appx93 (16:13-25), Appx108 (7:12-33), Appx114 (19:57-20:2).

While typical desktop and laptop browsers searching for information on the Internet could return a long list of web sites, that would not work for a voice-enabled browser—an audio response recounting a lengthy list of web sites would be neither desirable nor practicable for a user attempting to retrieve information using speech. To overcome this problem, the '941 and '402 patents disclose that the system's instruction set includes a database of pre-selected, ranked web sites, so that the web sites may be sequentially accessed by the computer in their ranked order until the identified information is retrieved. Appx93-94 (16:38-17:9), Appx114 (20:15-54). The patents further disclose a "polling mechanism" that "pings" the web sites periodically to update their ranking, and to ensure that "only those web sites that provide useful and error-free responses will be used by the voice browser system to gather information requested by the user." Appx93 (16:38-60), Appx114 (20:15-37).

The inventors thus created a voice-enabled information retrieval system that will "dynamically adapt to changes in the rapidly evolving web sites that exist on the Internet." Appx94 (17:7-9), Appx93 (16:26-29), Appx114 (20:50-53) (noting the invention "adapt[s] to changes that may occur as web sites evolve").

The Board treated independent claim 1 from both patents as representative in the respective IPRs. Appx5, Appx45.

Claim 1 of the '941 patent recites:

> **1.** A method for retrieving information from pre-selected web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:
>
> providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;
>
> providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;
>
> providing at least one instruction set stored in a database operatively connected to said computer, said instruction set comprising:
>
> > a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;
>
> providing a speech command to said speaker-independent speech recognition engine, said speech command corresponding to said instruction set;
>
> said speaker-independent speech recognition engine assigning said speech command to a recognition grammar, said speech command and said recognition grammar corresponding to said instruction set;
>
> transmitting said speech command to said speaker-independent speech recognition engine;

> said speaker-independent speech recognition engine receiving said speech command and selecting the corresponding recognition grammar upon receiving said speech command;
>
> said computer retrieving said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition engine;
>
> said computer accessing at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer first accessing said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;
>
> said speech synthesis engine producing an audio message containing any retrieved information from said pre-selected web sites; and
>
> said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

Appx95 (claim 1).

Claim 1 of the ’402 patent recites:

> **1.** A method for retrieving information from web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:
>
> providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;
>
> providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;

> providing a speech command to said speaker-independent speech recognition engine;
>
> said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved, said computer first accessing a first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;
>
> said speech synthesis engine producing an audio message containing any retrieved information from said web sites; and
>
> said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

Appx116 (claim 1).

Claim 2 of the '402 patent depends from claim 1, and recites:

> **2.** The method of claim 1 wherein said speech command is further associated with a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

Appx116 (claim 2).

C. The IPR Proceedings.

Google filed these petitions challenging claims 1-15 of each patent on the same four grounds. The first two grounds asserted obviousness based on proposed combinations involving "Kovatch," a PCT application dating from July 12, 2001, and "Neal," U.S. Patent No. 6,324,534. Appx6, Appx46, Appx235, Appx5658. Notwithstanding that Google's petitions for IPR focused on these references,

Appx238-273, Appx5661-5692, they are not at issue here. That is because, in response, Parus submitted substantial argument and evidence antedating Kovatch, showing that "the inventors conceived of those claims before the priority date of Kovatch … and diligently reduced the invention to practice." Appx496, Appx494-536, Appx5913-5944. Rather than address this evidence and resolve the antedating issue, Appx7, Appx46, the Board declined to reach the first two grounds offered in each of Google's petitions, Appx36, Appx74-75.

The third and fourth grounds in each petition were based on proposed combinations involving "Wise" and "Shaffer." Appx273-299, Appx5692-5716.

Wise. Wise, U.S. Patent No. 5,884,262, discloses a computer network audio access and conversion system that allows a user to access, via telephone, audio/visual formatted information. A user can specify a document and the system analyzes the document file to determine the types of information it contains. If such information is suitable for translation to an audio format, the system will perform the audio translation and play the audio content to the user. Appx1132 (Abstract).

Wise's architecture is shown in its specification's Figure 3:

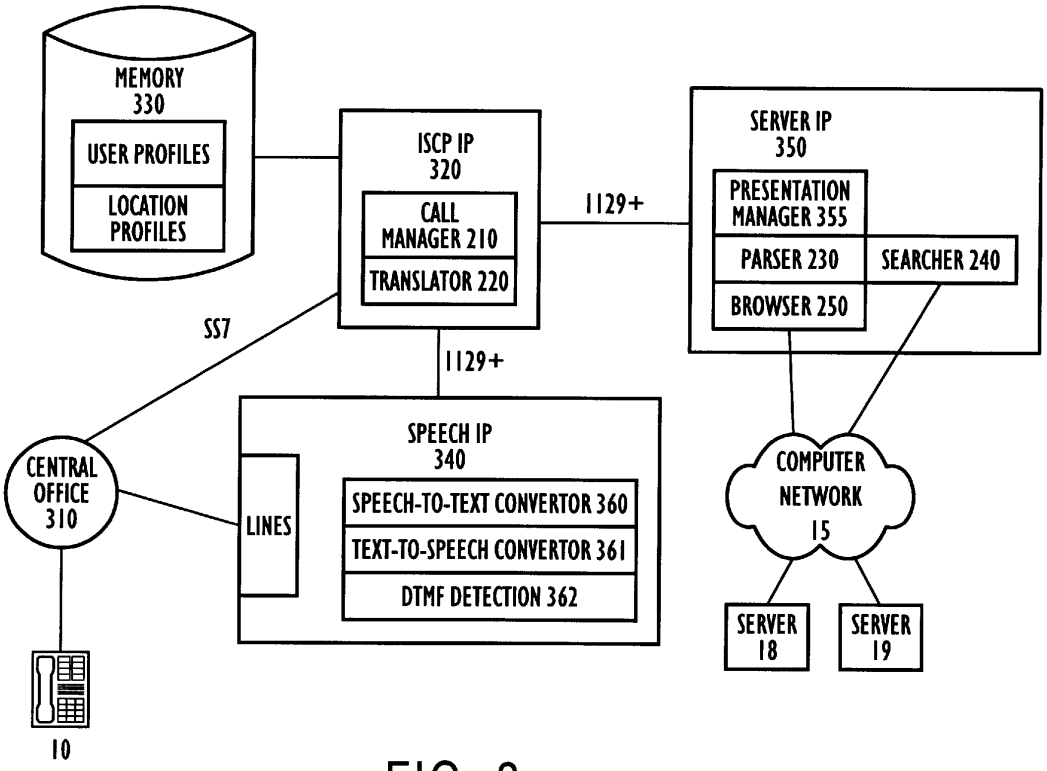


FIG. 3

Appx1135 (Fig. 3). The Server IP 350 block contains a Web Browser 250, a Parser 230, and a Searcher 240. The Browser 250 provides the capability to establish a connection to a server hosing a particular document file (a web page) and then download the complete file for subsequent processing by the Parser 230. Appx1140 (7:7-13). The Parser 230 provides the processing capability for interpreting documents located and accessed on the network. In this capacity, the Parser 230, which processes the complete document file, identifies and uses embedded information within the documents such as headings, labels, and comments. Appx1139 (5:66-6:13), Appx5131-5134, Appx7309-7312.

User commands from telephone 10 are captured by Call Manager 210 and translated by a speech-to-text engine embodied by Translator 220. Appx1139 (6:14-30). A "subject word or phrase" derived from the user command is passaged to Call Manager 210. Appx1139 (6:33-46). "At this point," Wise gives its user a binary choice: "the user may choose to invoke a search for related file addresses on the computer network. Otherwise, a predetermined audio-compatible address is selected by the system." Appx1139 (6:35-38). "The Call Manager 210 then routes this information to the Parser 230," which "may either match a predetermined file address, stored in memory, to the subject word or phrase or send the subject word or phrase to Search 240 … to find addresses of files on a target computer network 15 related to the subject word or phrase." Appx1139 (6:38-44).

"If a search is conducted and more than one address is returned by the searcher, the file addresses from the searcher are transformed into an audio menu so that the user may select a single address. A searcher returns an unordered list in HTML, which is transformed into an audio menu by the system." Appx1139 (6:52-57). "Once a single address is selected by the user, or if only one address is found by the Searcher, or if the file address is predetermined, the Parser passes the address to Browser 250 which established a connection to the appropriate server 18 through the network 15." Appx1140 (7:7-11). "Once the connection is established, the Browser 250 downloads the entire requested file and passes the file to the Parser

230. The Parser dynamically analyzes the structure and contents of the downloaded file." Appx1140 (7:13-14). "For each file segment, the Parser 230 passes the structure type and the associated text or audio contents to the Call Manager 210, which routes it to the appropriate [hardware] board to create an audio file to be played by audio file player 270." Appx1140 (7:34-37). "Throughout the speaking of audio filed by the system, the user may interact with the system using either using DTMF signaling or voice command or both." Appx1140 (7:56-58).

Shaffer. Shaffer, U.S. Patent No. 5,950,165, enables a user to navigate through a queued list of site-visit options. Shaffer describes, in an exemplary embodiment, a user's local computer system that includes a browser, a voice recognition unit, and a selector script. Appx1158 (Fig. 5), Appx1164 (5:26-33). While connected to the Internet, these components allow a user to inquire about web sites, generate a list of web sites, pare the list to create a queue of sites, and to optionally visit the sites in the queue. The option to visit a site is completely based on the user's decision. Appx1164 (5:34-63), Appx1165 (7:8-8:35), Appx5137. Figure 7 depicts the steps taken in Shaffer's user-directed approach:

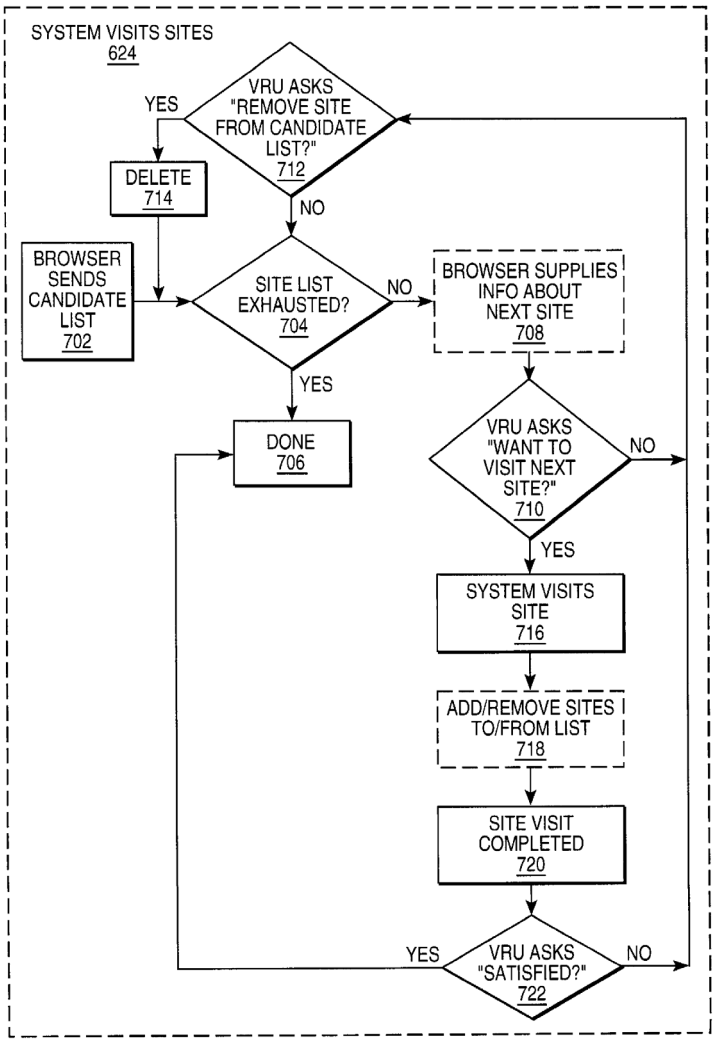


FIG. 7

Appx1160 (Fig. 7). After the user has had "an opportunity to pare the list, the system proceeds through the list, providing the user with an opportunity to visit each site." Appx1164 (5:39-6:29) ("[T]he method … inquires of the user … whether he wishes to visit the next site."). At each substep, the user is asked whether the user is satisfied and, if not, whether the user wishes to visit the next site on the list. Appx14, Appx1164 (6:6-12). This is repeated until the user is satisfied or the end of the list is reached. Appx1164 (6:3-6, 6:25-29), Appx14-15, Appx53.

D. The Board's Decisions.

The Board instituted the IPRs on claims 1-15 of the '941 and '402 patents, and after briefing and a hearing, concluded that Google carried its burden to show the challenged claims unpatentable as obvious under 35 U.S.C. § 103 in each IPR. Appx36-37, Appx75-76. Although Google offered proposed combinations of Kovatch and Neal as its first two grounds, the Board did not find that Google met its burden in either IPR on that basis. Appx36, Appx75. Instead, in view of the substantial argument and evidence Parus submitted showing that its inventions in the '941 and '402 patents antedated Kovatch, Appx496, Appx494-536, Appx5913-5944, the Board based its determinations of obviousness solely on the third and fourth grounds in Google's petitions, both of which turned on proposed combinations of Wise and Shaffer. Appx36-37, Appx75-76. In reaching its determination, the Board resolved a number of disputes between the parties as to particular limitations recited in the claims. Three are relevant to this appeal.

1. "Said computer sequentially accessing." For the limitation "said computer sequentially accessing said plurality of web sites"—found in every challenged claim in both patents—Parus explained that "said computer" means "said computer": this accessing limitation recited "action the computer is taking." Appx573, Appx5982. Google argued that, because "there is no description" in the '941 or '402 patents "of a user being involved" in the recited sequential access, that

meant user interaction and instruction were within the scope of the claims. Appx742. Thus, Google argued, Shaffer's user-iterated method satisfied the limitations in the '941 and '402 patents. Appx25, Appx60. Parus pointed out that Google's argument on this point reflected an (unbriefed and unacknowledged) "exercise of claim construction," Appx573, Appx5982, and at the hearing, Google likewise asserted that Parus' argument turned on a "claim construction view," Appx741.

In its final written decisions, the Board sided with Google, concluding that Parus' plain meaning position imported "an unclaimed negative limitation unsupported by the plain and ordinary meaning of the claim language and the specification." Appx62, *see also* Appx26. Because the specifications of the '941 and '402 patents are "silent with respect to user participation during sequential access," the Board reasoned, "Shaffer—which clearly involves user interaction, *see* [Appx1164 (6:3-29)]—meets the limitation." Appx26-27, *see also* Appx62-64.

2. "A plurality of pre-selected web site addresses." Every challenged claim of the '941 patent recites "a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved." Appx95-96. Google offered Wise as disclosing this limitation. Appx20. The Board found that "Wise has two modes for website retrieval, one that relies on memory storage [the 'first mode'] and one that relies on searching [the 'second mode']." Appx20. Parus explained that neither mode meets the recited limitation because,

among other reasons, the second mode involved no "*pre-selected* web site addresses," and the first mode involved no "*plurality* of pre-selected web site addresses," each identifying a web site "*containing said information* to be retrieved." Appx95 (claim 1) (emphases added), Appx567-570, Appx649-653.

Parus pointed out that Wise distinguishes between plural *addresses* containing relevant information, which are searched in its second mode, and a singular *address* containing the information, which is retrieved from memory storage in its first mode. Appx651-652, Appx568-569, Appx649-653, Appx1139 (6:35-44), Appx1140 (7:7-11), Appx5220-5224. Parus further offered a chart showing that, to obscure this fact, Google's petitions selectively quoted from Wise's disclosure to remove singular articles and add "[es]" wherever necessary to make the references appear plural:

Google	Wise
… passed to Call Manager 210 to select "***predetermined*** audio-compatible address[es]" and route them to Parser 230. [Appx1139] 6:31-40. Parser 230 either "match[es] … predetermined file address[es], stored in memory," to the word/phrase …	… passed to the Call Manager 210. ... Otherwise, **a predetermined audio-compatible address** is selected by the system … The Parser may either match **a predetermined file address**, stored in memory, to the subject word or phrase.

Appx569 (emphases in original), Appx274, Appx5693. The Board disagreed that Wise's disclosure was "clearly limited" in this way, Appx21, and determined—based solely on Wise's "first mode (memory storage),"Appx24—that Google met its burden for the challenged claims of the '941 patent. Appx24-25.

3. "Content descriptor." Claim 1 of the '402 patent recites "said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved." Appx116. Claim 2 depends from claim 1, and additionally recites:

> [t]he method of claim 1 wherein said speech command is further associated with a *content descriptor* associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

Appx116 (emphasis added). Claims 9-15 of the '402 patent also recite this "content descriptor." Appx116. Google offered Wise as disclosing this limitation—in particular, Google pointed to Wise's discussion of using HTML tags to navigate within selected web sites as teaching this "content descriptor." Appx66, Appx809.

Parus explained that HTML tags found within web pages inherently have none of the critical characteristics required of a "content descriptor": they are not associated with a web site *address*; they are not associated with a *speech command*; and they do not *pre-define* any portion of a web site containing the *said information* to be retrieved. Appx5977-5978, Appx6065-6068. Parus further pointed out that Wise does not teach any such associations; instead, Wise teaches using the "subject

word or phrase" (the alleged "speech command") to select and download a web page, and then subsequently—with additional voice commands—using the HTML tags to navigate within the downloaded web page. Appx5977-5978, Appx6065-6068.

The Board disagreed with Parus. Relying on a hypothetical offered by Google's expert, the Board reasoned that, if "today's stocks" was the "subject word or phrase" used to select the web page, and a "('tag') designating stock symbol links" was subsequently used to navigate within the page, then that "tag" would be "associated" with the "subject word or phrase" as required by the claim language. Appx67, Appx6018, Appx6708. The Board did not address whether, in that hypothetical, the "tag" would be associated with the web site address. Nevertheless, on this basis it found that Google met its burden with respect to the "content descriptor" limitations in claims 2 and 9-15 of the '402 patent. Appx67-68.

SUMMARY OF THE ARGUMENT

1. The independent claims of both the '941 and '402 patents recite "sequentially accessing" by "said computer." Appx95-96, Appx116. The Board found these limitations met by Shaffer's disclosure of a user-directed, user-iterated "sequential search technique." Appx18, Appx27, Appx62. That finding was based on the Board's reading of "the plain and ordinary meaning of the claim language and the specification," Appx62—it was, in short, based on the Board's construction of the "sequentially accessing" limitations. And that construction was in error.

The claim limitations are explicit: "sequentially accessing" is performed by "said computer." Appx95, Appx116. Google's expert agreed that references to "said computer" in this context recite "action the computer is taking." Appx573. The surrounding claim language further expressly distinguishes between the computer and its users, and between actions taken by "said computer" and actions taken by "said users." Appx95, Appx116. The recitation of "said computer" thus means what it says: this is action said computer is taking, not action said users are taking. The specifications are, furthermore, replete with descriptions of the automated nature of the method steps taken by the computer. Appx573, Appx654-655 Appx5982-5983, Appx6069-6072. On the other hand, the specifications offer "no description," as Google put it, "of a user being involved" in the recited sequential access. Appx742.

The Board nevertheless found that sequential access by "user interaction or instructions," as disclosed in Shaffer, satisfied these limitations. Appx61. It rejected Parus' plain-language reading—that "said computer sequentially accessing" meant "said computer sequentially accessing"—as importing "an unclaimed negative limitation unsupported by the plain and ordinary meaning of the claim language and the specification." Appx62. The Board, however, never examined the actual words of the claims. Instead, it jumped straight to the specifications. Appx26-27, Appx62-63. But having skipped over the claim language, the Board asked the wrong question when it reached the specifications: whether, in effect, they contain an express

disclaimer of sequential access "by users." And finding "no description" in the specifications "of a user being involved," Appx742, the Board concluded that Parus' plain-language reading was improper, Appx26-27, Appx62-63. Given the claim language, however, the question the Board *should have asked*, after examining the claims' plain language, is: whether the specifications provide any reason to conclude that the sequential access should be "by users" *rather than*, as the claims recite, "by computer." Had the Board asked the right question, it would have drawn the right inference from the specifications' exclusive focus on sequential access by computer: the claims' recitation of sequential access by "said computer" controls.

2. The Board committed a second error with respect to the '941 patent. Its claim 1 recites a "plurality of pre-selected web addresses, each said web site address identifying a web site containing said information to be retrieved." Appx95. The Board acknowledged that this limitation requires a "plurality" of pre-selected addresses, each identifying a web site containing the *same* "said information to be retrieved." Appx22. The Board found that Wise disclosed this limitation in "its first mode (memory storage)." Appx24-25. That finding, however, is unsupported.

As the Board explained, "Wise has two modes for website retrieval, one that relies on memory storage [the 'first mode'] and one that relies on searching [the 'second mode']." Appx20. And as noted, the Board expressly based its decision *only* on Wise's first mode. Appx24-25. Wise's disclosure, however, is explicit—its first

mode does not involve a "plurality of pre-selected of web addresses," each identifying a web site containing the same "said information to be retrieved." Instead, Wise consistently teaches a *single* predetermined web site from its memory storage for any given "subject word or phrase." Appx1139 (6:35-38, 40-44), Appx1140 (7:7-11). And Wise consistently distinguishes the *single* predetermined web site used in its first (memory storage) mode from the *plural*—but *not* predetermined—web sites involved in its second (searching) mode. *Compare* Appx1139 (6:35-37, 42-44) *with* Appx1139 (6:37-38, 40-42), Appx1140 (7:7-11).

The Board's contrary finding is not based on substantial evidence. Indeed, the Board's finding relied in significant part upon a snippet of cross-examination testimony from Google's expert that: (a) was not offered in Google's petition nor the declarations that accompanied it; (b) was based on speculation rather than any disclosure in Wise; and (c) Google's expert later disclaimed reliance on.

3. The Board committed an additional error with respect to the '402 patent. Its claim 1 recites "said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved." Appx116. And its dependent claim 2 recites: "[t]he method of claim 1 wherein said speech command is further associated with a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site

containing said information to be retrieved." Appx116.[1] The Board found that Wise disclosed this multi-layered "content descriptor" in its discussion of how HTML tags could be used to navigate through a web page that the system had already accessed and downloaded. Appx67-68. That finding, again, is unsupported.

Wise's HTML tags cannot meet the recited "content descriptor" limitation. Among other reasons, those tags "are part of the HTML code" *within* a web page, Appx809—they are therefore not "associated with each said web site *address*" as required. Appx116 (emphasis added). And the Board never found otherwise. Furthermore, Wise distinguishes between the "subject word or phrase" (the "speech command") used to access and download a web page and the tags that can subsequently be used—with additional voice commands—to navigate within that web page. There is no teaching in Wise, whatsoever, that its "subject word or phrase" is associated with tags that can be used for navigation. The Board offered a hypothetical thought experiment suggesting that there could be some coincidental thematic overlap between a particular "subject word or phrase" used to select the web page and some tag subsequently used to navigate through the web page. Appx67. But there is no teaching of an association between those features in Wise, and neither the Board nor Google ever pointed to any such teaching.

This Court should reverse.

[1] Claims 9-15 also recite the "content descriptor." Appx116.

STANDARD OF REVIEW

The Court's review of agency actions is rigorous. While a district court may be affirmed so long as its "result is correct," that is not so for an agency. *SEC v. Chenery Corp.*, 318 U.S. 80, 88 (1943). An agency action must be sustained on "the grounds upon which the [agency] itself based its action." *Id.* Thus the Court may "uphold a decision of less than ideal clarity if the agency's path may reasonably be discerned," but the Court will not "supply a reasoned basis for the agency's action that the agency itself has not given." *Rovalma, S.A. v. Bohler-Edelstahl GmbH & Co. KG*, 856 F.3d 1019, 1024 (Fed. Cir. 2017) (citation omitted).

Here the Board found Parus' patent claims obvious and, in doing so, effectively construed a claim term found in both the '941 and '402 patents. "Claim construction is a legal issue reviewed de novo," and when the construction is "based on underlying factual findings," those findings "are reviewed for substantial evidence." *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 990 (Fed. Cir. 2017). Similarly, this Court "review[s] the Board's ultimate determination of obviousness de novo and its underlying factual determinations for substantial evidence." *Id.* at 991. Substantial evidence is no toothless standard. The Court "examin[es] the record as a whole, taking into account evidence that both justifies and detracts from an agency's decision." *Id.* (citation and internal quotation marks

omitted). In doing so the Court asks "whether a reasonable fact finder could have arrived at the agency's decision." *Id.* (citation omitted).

ARGUMENT

I. The Board Erred In Reading the Claims as If They Recited "sequentially accessing" By "said users," Rather Than By "said computer."

For its alternative third and fourth grounds in both petitions, Google offered Wise as a primary reference. Appx273, Appx5692. Google conceded, however, that Wise does not disclose the "sequentially accessing" limitations in the '941 and '402 patent claims. Appx17, Appx60. The relevant step in claim 1 of the '941 patent is:

> said computer accessing at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer first accessing said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, *said computer sequentially accessing* said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed ….

Appx95 (claim 1) (emphasis added). And in claim 1 of the '402 patent:

> said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved, said computer first accessing a first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, *said computer sequentially accessing* said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed ….

Appx116 (claim 1) (emphasis added).

Google argued that a person of skill would look to "Shaffer's sequential search technique" to meet these limitations. Appx18, Appx60. The problem, as Parus

pointed out in response, is that the limitations in the '941 and '402 claims recite sequential access *by the computer*. Appx573, Appx5982. Shaffer teaches sequential access *by the user*: the user iteratively examines each web site in a "visit list"—itself initially determined by the user—to determine whether or not to access the next web site in the list. Appx573, Appx653-654, Appx5982, Appx6069, Appx1164 (5:33-6:30). In the context of the '941 and '402 patents, sequential access by computer and sequential access by user interaction and instruction are two dispositively different things. Appx26, Appx61, Appx653-654, Appx5982, Appx6069.

At the hearing, Google asserted that this dispute raised an issue of claim construction. Appx741. The Board agreed with Google and determined that Parus' reading of the limitations invoked "an unclaimed negative limitation unsupported by the plain and ordinary meaning of the claim language and the specification." Appx62, *see also* Appx26. That was reversible error.

A. This issue is subject to de novo review.

Google did not propose any construction for the "sequentially accessing" limitation in its petitions, and the Board did not address the limitation in the "claim construction" portions of its final written decisions. Nevertheless, both parties treated the dispute over this limitation as raising an issue of claim construction in the IPRs: in its response, Parus asserted that—while unbriefed and unacknowledged by Google—Google's position turned on an "exercise of claim construction," Appx573,

Appx5982, and at the hearing, Google argued that Parus' position turned on a differing "claim construction view." Appx741. Further, in resolving the dispute in its final written decisions, the Board "effectively construed the claim phrase," *see Board of Regents of Univ. of Tex. Sys. v. BenQ Am. Corp.*, 533 F.3d 1362, 1367 (Fed. Cir. 2008); *Linear Tech. Corp. v. ITC*, 566 F.3d 1049, 1059 (Fed. Cir. 2009)—determining the scope of the limitation based on its reading of "the plain and ordinary meaning of the claim language and the specification." Appx62, Appx26.

In these circumstances, this Court "address[es] the parties' dispute regarding th[e] limitation as a claim construction issue," subject to de novo review. *Linear Tech.*, 566 F.3d at 1059; *see also PersonalWeb Techs.*, 848 F.3d at 990.

B. The claims recite sequential access by "said computer."

Google argued that the user-directed, user-iterated approach disclosed in Shaffer met the "sequentially accessing" limitation recited in the '941 and '402 patents because, according to Google, the claim language recited in the '941 and '402 patents takes no position on "a user being involved or not being involved. It just doesn't say. It says that there is a sequential search, and doesn't say one way or the other how it's done." Appx742. That reading of the "sequentially accessing" limitation, however, is contradicted by the plain meaning of the claim term, the plain meaning of the surrounding claim language, and the specifications.

1. The disputed claim term. Claim construction typically "begins and ends" with "the actual words of the claim." *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-15 (Fed. Cir. 2005) (en banc). Contrary to Google's assertion that the disputed claim language "doesn't say one way or the other" whether the "sequential search" is "done" by the computer or by the user, Appx742, the actual words of the claims in fact spell that out explicitly: it is done by "said computer." Appx95 ('941 patent claim 1) ("said computer sequentially accessing said plurality of web sites"), Appx116 ('402 patent claim 1) (same). And as Parus pointed out, Google's expert Mr. Lipoff agreed that the claims' references to "said computer" in this context recite "action the computer is taking." Appx573, Appx5982, Appx4966-4967. Regarding the user-versus-computer dispute between the parties, therefore, the plain claim language—as read by anyone, including one of skill in the art—provides a ready answer: the "sequentially accessing" limitations are performed by "said computer." Appx95, Appx116. They are therefore, and indisputably, "action[s] the computer is taking." Appx573, Appx5982, Appx4966-4967, Appx5225-5232.

2. The surrounding claim language. The "context of the surrounding words of the claim" can "also be valuable sources of enlightenment as to the meaning of a claim term." *Phillips*, 415 F.3d at 1314. That is true here. Indeed, the recitation of "said" computer in the limitation at issue refers back to antecedent limitations—

suggesting that context is relevant. *See Baldwin Graphics Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) (explaining that use of "said" refers to earlier limitations). And given the parties' user-versus-computer dispute, the surrounding claim language should be reviewed for recitation of any role played by "users."

Such a review proves fruitful, as the surrounding claim language recites both "a computer" (and "said computer") as well as "users" (and "said users"). Significantly, the claim language clearly distinguishes between the users and the computer. *Compare* Appx95-96 (19:32-33, 40-41, 48-49; 20:9-10, 46-47; 21:10-12; 22:7-8) *with* Appx95-96 (19:61-67; 20:21-23; 21:14-21, 27-28). In claim 1 of the '941 patent, for example, the *computer* is "operatively connected to," among other things, a "speaker-independent speech recognition engine" and a "voice enabled device." Appx95 (19:35-38). That voice enabled device, in turn, is "configured to receive speech commands from *users*." Appx95 (19:40-41) (emphasis added). Those *users* provide "a speech command" to the speaker-independent speech recognition engine that is connected to the *computer*, and then the speaker-independent speech recognition engine and the *computer* perform an ordered series of steps leading up to the one at issue: "said *computer* sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed." Appx95 (20:2-5). Following this step, a "speech synthesis engine" that is also connected to the *computer* "produc[es] an audio message containing any

retrieved information" and then "transmit[s] said audio message to *said users* via said voice enabled device." Appx95 (emphasis added). Claim 1 of the '402 patent recites substantially similar (and similarly distinct) roles for the computer and the users of the claimed method. *Compare* Appx116 (23:9-10, 17-18, 33-34; 24:2-3, 21-23, 42-44) *with* Appx116 (23:21-24, 44-46; 24:24-28, 34-35).

When claims recite "the 'user' and 'computer' [as] distinct entities"—as do the claims of the '941 and '402 patents—that distinction must be preserved in claim construction. *z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347-48 (Fed. Cir. 2007). Any "construction that would equate a 'user' with a 'computer or computers' conflicts" with the "plain language of the claims" and "cannot be sustained." *Id.* When the claims at issue here recite "sequentially accessing" by "said computer," therefore, they mean what they say—the computer is taking this action. Users have a role to play in one of the initial steps of the claimed method: they provide the speech command that is received by the voice enabled device. Appx95. They also have a role to play in the final step of the claimed method: the voice enabled device transmits an audio message "to said users." Appx95. In the middle steps, users play no role: those recited actions are taken by the computer and its operatively connected engines. Appx95, Appx573, Appx5982, Appx4966-4967; *cf. Mformation Techs., Inc. v. Research in Motion Ltd.*, 764 F.3d 1392, 1398-99 (Fed. Cir. 2014) (explaining

that a claim "requires an ordering of steps when the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written").

3. The specification. Because the claims expressly recite that "sequentially accessing" is performed by "said computer"—and *not* "said users"—Google's position that a user-directed, user-iterated search reads on the claims could *only* have merit *if* there were some lexicography or disavowal in the specifications. *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). In other words, given the claims' express distinction between the "users" and the "computer," and given the claims' express recitation that it is the "computer," and not the "users," performing the sequential access limitation, Google's reading could only win the day were there some definition or disavowal in the specifications that—notwithstanding the express claim language—the inventors required that the recited sequential access could in fact be accomplished through "user" interaction or instruction. *Cf. id.* (discussing the doctrines of lexicography and disavowal).

But there is no such teaching in the specifications. To the contrary, as Google itself asserted, "there is no description" in the '941 or '402 patents "of a user being involved" in the sequential access. Appx742. And in this context—where the claims recite sequential access by "said computer," Appx95, Appx116—silence in the specifications as to any other possibility ends the analysis.

The specifications' stony silence as to the possibility of a user-directed, user-iterated sequential access forecloses Google's position. Appx573, Appx5982-5983. It is worth noting, however, that the specifications have plenty to say regarding *why* the claims recite sequential access by "said computer." Appx95, Appx116, Appx654-655, Appx6069-6072. The specifications explain, for example, that the system must "quickly and accurately provide information requested by a user." Appx86 (2:40-44, 55-58) ("speed is an important factor for maintaining the system's desirability and usability"), Appx87 (3:63-4:8) ("Long delays before receiving responses to requests are not tolerated by users of voice-based systems, such as telephones. When a user speaks into a telephone, an almost immediate response is expected."). Given this need for speed and accuracy, the inventors determined that the system's polling, ranking, and accessing functions would all be performed automatically—by "said computer." Appx95 (claim 1), Appx116 (claim 1), Appx93 (16:38-48) (describing how the "polling mechanism continually polls or 'pings' each of the sites listed in the database"), Appx87 (3:7-12) ("ranking order is automatically adjusted if the system detects that a given web site is not functioning"), Appx87 (3:56-65) (explaining that automation "allows the system to detect changes in web sites and adapt to those changes in real-time"), Appx94 (17:4-9) (describing how "constant polling and re-ranking of the web sites used within each category" allows the system "to dynamically adapt to changes in the rapidly evolving web sites that

exist on the Internet"), Appx114 (19:65-20:2) ("If the information requested by the user cannot be found at this first web site, then the web browsing server 102 will search the second ranked web site and so forth down the line until the requested information is retrieved or no more web sites left to check."), Appx5225-5232.

The specifications thus provide no support for Google's position. Given that the claims expressly distinguish between "said computer" and "said users,"—and they recite sequential access by "said computer," and *not* "said users"—the fact that the specifications teach automation of the functionality and offer "no description" whatsoever "of a user being involved," Appx742, means that Google cannot be right.

C. The Board erred in concluding otherwise.

The Board nevertheless concluded Google was right, and, based on the "plain and ordinary meaning of the claim language" as well as the specifications' alleged "silence" on user interaction and instruction, Shaffer's user-directed, user-iterated approach met the "sequentially accessing" limitations. Appx62-63, Appx26-27.

The Board's analysis consisted primarily of "agree[ing]" with Google that Parus' position relied upon "an unclaimed negative limitation unsupported by the plain and ordinary meaning of the claim language and the specification." Appx62. Citing to *Novartis*, the Board observed that, "[w]hile a negative limitation need not be recited in the specification *in haec verba*, there generally must be something in the specification that conveys to a skilled artisan that the inventor intended the

exclusion." Appx62, Appx26; *Novartis Pharm. Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1017 (Fed. Cir. 2022). The Board then found that Parus did "not provide sufficient evidentiary support that conveys an intended exclusion of user interaction during sequential access," and the fact that "both parties and both experts" agreed that the specifications were "silent with respect to user participation during sequential access" meant there was no "negative limitation"—as Google called it—in the challenged claims. Appx62, Appx26. "Based on these facts," the Board "determine[d] that Shaffer—which clearly involves user interaction, *see* [Appx1164 (6:3-29)]—meets the limitation." Appx27, Appx63.

The Board's analysis missed from the start by ignoring the actual claim language. The Board repeatedly asserted that its determination on this issue was based on the "plain and ordinary meaning" of the claims. Appx26 ("the plain and ordinary meaning of the ['941 patent] claim language"), Appx27 ("the plain and ordinary meaning of the ['941 patent] sequential access limitation"), Appx62 ("the plain and ordinary meaning of the ['402 patent] claim language"), Appx63 ("the plain and ordinary meaning of the ['402 patent] sequential access limitation"). But never did the Board grapple with the relevant claim language: it ignored that the claims recite "sequentially accessing" by "said computer," and further distinguishes "said computer" from "said users"—which users play a separate role in earlier and later steps in the claimed method. Had the Board considered the actual language of

the claims, it would have appreciated that Parus' position had nothing to do with any purportedly "unclaimed negative limitation." Appx62, Appx655, Appx6071.

Instead, Parus' position was that the claims recite affirmative limitations: they expressly require sequential access by "said computer." Appx95, Appx116, Appx573, Appx5982, Appx4966-4967. The claims and specifications are fully consistent in reciting and teaching that the "computer is the only entity that performs sequential access." Appx655, Appx6071, Appx114 (19:65-20:2).

Even viewed through the lens of negative-limitation case law, however, the Board's determination is erroneous. That case law makes clear that a negative-limitation analysis, like any claim-construction analysis, must begin with the claim language. *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1322-23 (Fed. Cir. 2003) (asking first whether a negative limitation finds "anchor in the explicit claim language"); *Kamstrup A/S v. Axioma Metering UAB*, 43 F.4th 1374, 1383 (Fed. Cir. 2022) (asking first whether a negative limitation "is at odds with the claim language"); *Lenovo Holding Co. v. DoDots Licensing Solutions LLC*, No. 21-1247, 2021 WL 5822248, *3 (Fed. Cir. Dec. 8, 2021) (unpublished) (noting that a negative limitation "must find support" either, first, in "the words of the claim," or, second, "in the written description"). Had the Board started with the claims, again, it would have found that they recited "sequentially accessing" by "said computer," and *not* by "said users." To the extent that Parus' position is viewed as a "negative

limitation," therefore, it has support in the claim language: the computer, and not the users, must perform the recited "sequentially accessing" limitation.

But the Board did not start with the claims. Instead, it cited *Novartis*—a case addressing the statutory written description requirement, not claim construction, *Novartis*, 38 F.4th at 1016-20—and jumped straight into the specifications. Appx26-27, Appx62-63. Having done so, the Board asked the wrong question: whether the specifications contain an express disclaimer of sequential accessing "by users." *See* Appx26-27, Appx62-64. The right question, in view of the recited claim language, is whether the specifications provide any reason to conclude that the sequential access should be "by users" rather than, as the claims recite, "by computer." Appx95, Appx116. There is no dispute that they do not.

Having started with the wrong question, the Board's analysis of the specifications reached the wrong result: silence as to sequential access by users in the specification could only mean that the issue was controlled by the claims' recitation of sequential access by computers. That should have ended the matter.

The Board's specification analysis was flawed for additional reasons. First, the Board appeared to place the burden *on Parus* to "provide sufficient evidentiary support" from the specifications for its plain-language claim reading. Appx62, Appx26. That was error: the burden to provide sufficient support for its positions

was *on Google* throughout this proceeding. *See* 35 U.S.C. § 316(e); *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

Second, for the '402 patent, the Board hand-waved the numerous specification cites teaching automation and the need for speed and efficiency (*supra* pp. 36-37) with the non sequitur observation that a "given course of action often has simultaneous advantages and disadvantages, which 'does not necessarily obviate motivation to combine.'" Appx63 (citation omitted). But the Board identified no conceivable advantages for replacing the recited sequential access by the computer with Shaffer's user-directed, user-iterated access approach. In any event, the Board was not here addressing a question of motivation to combine; it was addressing a question of claim construction. And the written description teachings of the need for speed, efficiency, and automation (*supra* pp. 36-37) plainly support the expressly claimed requirement that sequential access be performed by "said computer."

Third, for the '941 patent, the Board treated Parus' explanation that "the '941 patent teaches **against** the notion of user interaction" as "a new argument impermissibly raised for the first time in the Sur-Reply." Appx27 (n.5) (emphasis in original). The Board then noted that it considered the argument "unpersuasive" in any event, as it found "the specification to be 'silent' on user interaction." Appx27 (n.5). These findings are of no moment, for a few reasons. (1) The interpretive issue raised here is subject to de novo review, and in completing that review this Court

must examine both the claims and specifications for itself. *See Trs. of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1362-63 (Fed. Cir. 2016). (2) The issue was not fully joined as one of claim construction until Google took that position at the hearing. Appx742. In these circumstances, there can be no waiver for failing to offer claim-construction arguments that were not ripe at the time of briefing. *See Qualcomm Inc. v. Intel*, 6 F.4th 1256, 1263 (Fed. Cir. 2021). Indeed, should Google complain that some of the claim-construction arguments above were not fully fleshed out in the briefing before the Board, that is due to Google's own delay in acknowledging that its position required the Board to construe the "sequentially accessing" limitations. Appx742. In these circumstances, this Court sometimes remands for the parties to engage in further briefing below. *See Qualcomm*, 6 F.4th at 1263. But that is not necessary here, as this Court is fully competent to resolve the plain-language claim construction dispute on this de novo review. (3) As shown above, there is no need for resort to any argument regarding whether the '941 patent specification "teaches **against** the notion of user interaction" to resolve the construction issue. Appx27 (n.5) (emphasis in original). Because the claims recite sequential access "by computer," *not* "by users," silence in the specification as to users merely confirms that the plain claim language controls.

The Board conceded that Shaffer's user-directed, user-iterated approach "clearly involves user interaction." Appx27, *see also* Appx62-64. And the Board's

determination that Shaffer's approach disclosed the recited "sequentially accessing" limitations turned on its assumption that applying the plain claim language would be to invoke "an unclaimed negative limitation." Appx62, *see also* Appx26. That was legal error under any standard of review—whether de novo or review for substantial evidence. And that error with respect to the reading of "the plain and ordinary meaning of the claim language and the specification" requires reversal of the Board's obviousness determination. *See Corning v. Fast Felt Corp.*, 873 F.3d 896, 903 (Fed. Cir. 2017) (reversing where, "[b]ased on the record before [the Court], there is only one permissible factual finding"); *Carrum Techs., LLC v. Unified Patents, LLC*, No. 20-2204, 2021 WL 3574209, at *7 (Fed. Cir. Aug. 13, 2021) (unpublished) (same).

Because the Board treated claim 1 as representative for each of the respective '941 and '402 patent claims, Appx5, Appx45, this error applies to and undermines its determination on every claim challenged in both of Google's petitions.

II. The Board Erred in Determining That the Recited "plurality of pre-selected web site addresses" Is Disclosed in the Prior Art.

The Board committed a second error with respect to the '941 patent. In the claims of the '941 patent, *what* "said computer" sequentially accesses is "a plurality of pre-selected web site addresses, each said web site address identifying a web site

containing said information to be retrieved." Appx95 (claim 1).[2] In other words, "[a]s an example" from the specification, "three different web sites may be listed as searchable under the category of 'restaurants' …. If the information requested by the user cannot be found at th[e] first web site, then the web browsing server 102 will search the second ranked web site and so forth down the line until the requested information is retrieved or no more web sites are left to check." Appx93 (16:14-25). This requirement for "a plurality of pre-selected" web sites, each containing the *same* "said information to be retrieved," is important: it was designed to address the "rapidly evolving" nature of the Internet, in which any given web site may be changed or cease to function at any moment. Appx87 (3:7-12, 56-65), Appx94 (17:4-9) (describing how the "voice browser system" of the '941 patent "dynamically adapt[s] to changes in the rapidly evolving web sites that exist on the Internet").

Google offered Wise as purportedly disclosing this "plurality of pre-selected web site addresses," each web site address identifying a web site containing the same "said information to be retrieved." Appx20. The Board's finding that Wise discloses this element, however, Appx24-25, is not supported by substantial evidence.

[2] The preamble of claim 1 also recites "[a] method for retrieving information from pre-selected web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device." Appx20, Appx95 (claim 1). The Board's final written decision applied the same analysis to find the recited element met in both the preamble and the body of the claim, and that analysis fails, as to both findings, for the reasons addressed below.

A. Wise does not disclose a "plurality of pre-selected web addresses, each said web site address identifying a web site containing said information to be retrieved," as recited in the '941 patent.

As the Board explained, "Wise has two modes for website retrieval, one that relies on memory storage [the 'first mode'] and one that relies on searching [the 'second mode']." Appx20. And as Wise teaches:

> Once the numeric, alphanumeric, or voice command information from the telephone 10 is translated, the subject word or phrase is passed to the Call Manager 210. At this point, the user may choose to invoke a *search for related file addresses* on the computer network [the second mode]. Otherwise, *a predetermined audio-compatible address* is selected by the system [the first mode].

Appx1139 (6:35-38) (emphases added), Appx20. In short, Wise offers its users a binary choice: for any given "subject word or phrase," the user may either (1) take the "predetermined audio-compatible address" that is linked with that subject word or phrase in memory storage, or (2) invoke a search for "related file addresses" on the computer network. Appx1139 (6:31-46), Appx567-570, Appx649-653.

The Board spent time in its final written decision addressing the parties' dispute over whether Google's expert, Mr. Lipoff, improperly mixed Wise's two modes, or had disclaimed reliance on Wise's second mode, in forming his opinions. Appx23-24. But no matter—the Board ultimately based its decision only on Wise's "first mode (memory storage)," Appx24-25, and so its determination can only be affirmed, if at all, on that ground. *See Chenery*, 318 U.S. at 88.

But the Board's determination cannot be affirmed on that ground. Wise's first mode plainly fails to meet the recited limitations. The memory storage mode involves neither searching nor a plurality of web addresses that *each* contain the same information to be retrieved. Appx567-570, Appx649-653.

Wise's disclosure makes this clear. Indeed, the Board's own description of the two modes leaves no doubt that the first mode "relies on memory storage"—only the second "relies on searching." Appx20, Appx24-25. And the passage from Wise highlighted by the Board explicitly distinguishes between the singular predetermined "address" selected from memory storage in the first mode and the plural "addresses" resulting from the search in the second mode. Appx20, Appx1139 (6:35-38) (distinguishing, in contiguous sentences, between the "search for related file addresses" in the second mode and the selection from memory storage of "a predetermined audio-compatible address" in the first mode). When patents distinguish between plural and singular in back-to-back sentences, that distinction has meaning and must be respected. *Harari v. Lee*, 656 F.3d 1331, 1341 (Fed. Cir. 2011) (explaining that contiguous distinctions "between the singular and plural" indicate that the singular use carries a singular meaning); *August Tech. Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1284 (Fed. Cir. 2011) (rejecting a reading that "renders any difference between the singular and plural terms superfluous"); *cf. KEYnetik, Inc. v. Samsung Elecs. Co.*, 841 Fed. App'x 219, 229 (Fed. Cir. Jan. 27, 2021)

(unpublished) (holding that a distinction between plural and singular in back-to-back sentences meant that "the singular use carried only a singular meaning").[3]

The passage highlighted by the Board—while itself dispositive—does not stand alone. An obviousness analysis requires that prior art references be considered "as a whole," *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987), and Wise consistently describes its first mode as involving, for each subject word or phrase, only a single predetermined address stored in memory. That is, Wise consistently discloses *only* a one-to-one relationship between a subject word or phrase and a predetermined file address. Appx568-569, Appx649-653, Appx1138-1139 (6:37-42, 7:7-9), Appx1141 (10:38-44), Appx5220-5224, *see also* Appx5008-5010, Appx5012 (150:9-18).

The abstract in Wise, for example, explains that "[a] user can call a designated telephone number and request a file via dual-tone multi-frequency (DTMF) signalling [sic] or through voice commands. The system analyzes the request and accesses *a predetermined document*." Appx1132 (emphasis added). In explaining the two modes, Wise's disclosure further provides that "[t]he Parser may either match *a predetermined file address*, stored in memory, to the subject word or phrase or send the subject word or phrase to Searcher 240 … to find *addresses of files* on a

[3] Google's petitions implicitly acknowledged this evidentiary deficiency, selectively quoting from Wise's disclosure to remove singular articles and add "[es]" wherever necessary to make the references appear plural. Appx569, Appx274, Appx5693.

target computer network 15 related to the subject word of phrase." Appx1139 (6:40-44) (emphases added). Here, Wise distinguishes between a singular address (in the first mode) and plural addresses (in the second mode) *in the same sentence*. That distinction is meaningful and must be given effect. *Harari*, 656 F.3d at 1341.

There is more: Wise explains that, "[o]nce *a single address* is selected by the user, or if *only one address* is found by the Searcher, or if *the file is predetermined*, the Parser passes the address to Browser 250 which establishes a connection to the appropriate server 18 through the network 15." Appx1140 (7:7-11) (emphases added). This passage—which effectively equates, for the purposes of passing "the address" to the browser, "a single address," "only one address," and the "predetermined" address—further confirms that the predetermined address is *one single* address. Appx1140 (7:7-11), *see also* Appx5220-5224.

The first "memory storage" mode in Wise thus provides no teaching of a "plurality" of pre-selected web site addresses, "each said web site address identifying a web site containing said information to be retrieved." Instead, as Parus explained, Wise discloses only a one-to-one correspondence between any given subject word or phrase and a predetermined file address. Appx568-569.

B. The Board's contrary finding lacks evidentiary support.

The Board's conclusion that Wise discloses the recited "plurality of pre-selected web addresses" through "its first mode (memory storage)" was based on

two pieces of evidence. Appx22-25. Neither piece, however, provides any substantial support for the Board's determination.

> The first is "Wise's claim 8," Appx22, a dependent claim that recites:
>
> [a]n interface system according to claim 1 further comprising: a computer memory connected to the parser for storing predetermined file addresses.

Appx1141-1142 (claim 8). According to Google and the Board, in using the plural "addresses," claim 8 discloses "that there may be more than one predetermined website address" stored "in a computer memory that is connected to the Parser." Appx21-22. Fair enough. But neither that observation, nor anything else in claim 8, suggests anything other than a one-to-one correspondence between a subject word or phrase and a predetermined web site address in Wise's memory storage. Appx651-652, Appx568-569, Appx649-653, Appx5220-5224. Indeed, were Wise's memory storage limited to *one* predetermined web site address, its first mode would only work for *one* subject word or phrase. That mode, in other words, would be trivial, or at least severely limited. So of course there may be more than *one* predetermined web site address stored in computer memory. The significant question—as the Board acknowledged—is whether the computer memory stores a plurality of predetermined web site addresses that each contain "the **same** 'said

information to be retrieved.'" Appx22, Appx649-653.[4] Claim 8 says nothing whatsoever about that requirement. The answer to *that* critical question, therefore, can only be found in Wise's written description. And as shown above, with respect to any given subject word or phrase, Wise treats the "predetermined" web site address as "a single address." Appx1140 (7:7-11), Appx1139 (6:31-46), Appx568-569, Appx649-653. Claim 8 thus provides no support for the Board's determination.

While the Board primarily relied on claim 8, it also cited to some deposition testimony from Mr. Lipoff as "instructive on this point." Appx23. In particular, the Board noted that "Mr. Lipoff described Wise's functionality on cross-examination as storing websites previously found by the searcher as 'preselected websites' in local memory." Appx23. And if that were true, then Wise could "select one of such preselected websites from local memory within its first mode." Appx23. There are at least three fatal flaws with the Board's reliance on this "instructive" testimony.

First, this purportedly invalidating theory of "Wise's functionality" was not offered in Google's petition, nor in any declaration submitted with the petition. Thus, as a matter of law, it cannot support any determination of obviousness. *See* 35 U.S.C. § 312(a)(3); *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1355-58 (2018) (explaining that the contentions in the petition for IPR must "define the scope of the litigation

[4] For example, a weather-related phrase might be linked to, among others, cnn.com/weather and weather.lycos.com—a plurality of predetermined web sites that each contain the same desired weather-related information. Appx88 (5:31-50).

all the way from institution through to conclusion"); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (explaining that unpatentability theories must be presented in the petition for IPR); *In re NuVasive, Inc.*, 841 F.3d 966, 971 (Fed. Cir. 2016) (explaining that the Board cannot invalidate a patent based on a theory not presented in the petition for IPR).

Second, this purportedly "instructive" cross-examination testimony regarding "Wise's functionality" did not come from any express teaching in Wise; it came from the imagination of Mr. Lipoff. Appx23, Appx2301, Appx5009-5013. Indeed, in the testimony cited by the Board, Mr. Lipoff never opines that Wise expressly teaches, as the Board put it, "storing websites previously found by the searcher as 'preselected websites' in local memory." Appx23, Appx5009-5013. There is no such teaching in Wise, and the Board never pointed to any such teaching in Wise. Appx22-25. Instead, Mr. Lipoff speculates that Wise *might* function that way, but he concedes that "it's not clear" how "preselected websites may get in the parser." Appx5010, Appx5012, *see also* Appx2301 ("I thus explained at my deposition how preselected websites *could* get to the Parser.") (emphasis added).

Given the lack of express disclosure, Google would have to show that this functionality upon which the Board relied was inherent in Wise. *See Par Pharm., Inc. v. TWi Pharms., Inc.*, 773 F.3d 1186, 1195-96 (Fed. Cir. 2014). But the law of inherency sets a "high standard" for argument and evidentiary proof in the context

of obviousness, *see id.*—a standard Google made no attempt to meet. Indeed, Mr. Lipoff's acknowledged testimony conceding the possibility of other "way[s] in which the preselected websites may get in the parser," Appx23 (n.4), Appx5010, forecloses application of the inherency doctrine as a matter of law. *Par Pharm.*, 773 F.3d at 1995-96. Again, therefore, Mr. Lipoff's purportedly "instructive" testimony cannot support the Board's determination.

Third, and finally, Mr. Lipoff *expressly disclaimed his own reliance* on the very piece of testimony that Board cited in support of its determination. The portion of Mr. Lipoff's cross-examination testimony that the Board found significant and persuasive was his speculation that "Wise's functionality" included "storing websites previously found by the searcher as 'preselected websites' in local memory." Appx23, Appx5010. In other words, the Board found significant Mr. Lipoff's speculative proposition—not disclosed in Wise—that the "preselected websites" initially came into the parser memory from the searcher. Appx23.

In the very next breath of his cross-examination, however, Mr. Lipoff clarified that he simply understood that "the parser has got preselected websites stored in its memory, and how they got there is not relevant to forming [his] opinion." Appx5010. To remove all doubt, Mr. Lipoff clarified in a follow-on declaration that his "testimony [was] that, however the preselected websites are stored into the Parser

memory in the first place, whether from the Searcher or otherwise, is not important to [his] opinion regarding Wise's teachings of 'preselected websites.'" Appx2303.

Surprisingly, one page after *relying* on Mr. Lipoff's speculation that the preselected web sites might initially be stored into the parser memory from the searcher, Appx23, the Board credited Mr. Lipoff's reply declaration testimony *disclaiming reliance* on "how the preselected websites are stored into the Parser memory in the first place, whether from the Searcher or otherwise," Appx24. The Board reasoned that this reply declaration indicated that Mr. Lipoff was not recanting his earlier discussions of Wise's second mode. Appx24. The Board apparently failed to appreciate, however, that Mr. Lipoff's reply declaration unmistakably *was disclaiming reliance* on any speculation that "Wise's functionality" included "storing websites previously found by the searcher as 'preselected websites' in local memory." Appx23, Appx2303.

In short, neither Wise's dependent claim 8 nor any testimony from Mr. Lipoff provides substantial evidentiary support for the conclusion that Wise discloses "a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved." Appx95 (claim 1). The Board's determination that Wise discloses this limitation through "its first mode (memory storage)," Appx24-25, thus cannot stand, and reversal of the Board's obviousness determination is required. *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1361 (Fed.

Cir. 2019) (reversing where the Board's obviousness determination rested on insufficiently supported "findings regarding the scope and content of the prior art").

Because the Board treated claim 1 as representative for the '941 patent, Appx5, its error on the "plurality of pre-selected web site addresses" applies to and undermines its determination on every claim challenged as to that patent, Appx37.

III. The Board Erred in Determining That the Claimed "content descriptor" Is Disclosed in the Prior Art.

The Board also committed an additional error with respect to the '402 patent. As noted, claim 1 recites "said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved." Appx116 (claim 1). Claim 2 depends from claim 1, and recites:

> [t]he method of claim 1 wherein said speech command is further associated with a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

Appx116 (claim 2). As the specification explains, the "content descriptor" recited in claim 2 is "associated with the web page identified by the URL 204." Appx6067, Appx108 (7:12-32). The content descriptor "directs the extraction agent where to extract data from the accessed web page and how to format a response to the user utilizing the data. For example, the content description for a web page providing weather information would indicate where to insert the 'city' name or ZIP code in order to retrieve Chicago weather information." Appx6067, Appx108 (7:12-32). The

critical points, with respect to the requirements of claim 2, are that the recited content descriptor must: (1) be associated with "said speech command"; (2) be associated with "said web site address" (the URL); and (3) "pre-defin[e] a portion of said web site containing said information to be retrieved." Appx116 (claim 2).

Google offered Wise's reference to HTML tags as purportedly disclosing this "content descriptor." Appx66, Appx809. The Board's finding that Wise discloses this element, however, Appx67-68, is not supported by substantial evidence.

A. Wise does not disclose a "content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved," as claimed in the '402 patent.

Google argued in its petition, as the Board noted, that "Wise's documents contain content 'useful for navigation'" such as HTML "tags that 'designat[e] links or portions of a document.'" Appx65, Appx5704. Google further argued that "software residing on the server IP uses Wise's document(s) with tags to execute the functionality of the 'content descriptor' as described by the '402 patent." Appx65, Appx5704. At the hearing, Google confirmed that it was offering HTML tags as purportedly meeting this limitation: "Right. So, the descriptors that we point to are Wise's tags. And so, those content descriptors are part of the webpage. They are part of the HTML code that defines the webpage." Appx809. But Wise's tags cannot be the claimed content descriptors, for three reasons.

First, as Parus explained, such tags are not "associated with each said web site address," Appx116, Appx5978, Appx6065-6066—there is no association between an HTML tag and a particular web site URL. The claim language requires an association with the web site *address*, not "with the navigational content *within* a webpage file that is ultimately downloaded"—that is, Wise's tags used for navigation. Appx6066. Indeed, likely for that reason, Mr. Lipoff admitted that the content descriptor file "is a different file" than the web page itself. Appx6068, Appx7434 (17:15-20). And as Google conceded at the hearing, Wise's tags "are part of the webpage. They are part of the HTML code that defines the webpage." Appx809. There can be no substantial dispute, therefore, that Wise's tags are not "associated with each said web site address," as the claim language requires. Appx116 (claim 2). That observation alone should end the matter.

Second, as Parus also explained, Wise's tags are not "associated with each said speech command," as the claim requires. Appx116, Appx66, Appx5977-5978. There is no dispute that Wise uses multiple steps to access any "information to be retrieved." Appx66-67, Appx5977-5978. In an initial step, a subject word or phrase—which Google alleges is the "speech command"—is used "to indicate a particular website address so that the particular web page can be downloaded and processed." Appx5978, Appx1139 (6:31-51). In a later step, requiring separate and additional commands, Wise's tags can be "use[d] for navigation" within the web

page that has been downloaded. Appx5978, Appx1137 (2:5-41). In some hypothetical scenario there might be a coincidental thematic overlap between the "subject word or phrase" used to select the web page and text or tags subsequently used to navigate through the web page. But there is no functional or systemic association between the "subject word or phrase" and any tag with the web page's HTML code—and Wise never teaches any such association.

Third, for similar reasons, Wise's HTML tags do not "pre-defin[e] a portion of said web site containing said information to be retrieved," as required by claim 2. Appx116, Appx768, Appx6066-6068. Wise explains how its HTML tags are used: "For example, if a Web page is returned from the Internet, the title of the Web page may be read in a low male voice. Headline information may be read in a different voice. General text information may be read in a different voice." Appx769, Appx1137 (2:18-27). Such tags do not pre-define a portion of a web site "containing said information to be retrieved." Appx116 (claim 2). Indeed, these tags merely indicate the classification or type of a particular section of the HTML document. For example, a title HTML tag simply indicates a section of text that is the title for the web page. As a further example, a typical HTML title tag may be: "<title>HTML Elements Reference</title>." This provides no information about the actual words within the tag. In the context of the '402 patent, "said information" is predetermined: it is associated before the fact with the speech command, with the plurality of web

sites to be sequentially accessed, and with the content descriptor that pre-defines its location in the plurality of web sites. HTML tags are not pre-defined in that way, and nothing in Wise's discussion of tags that are "useful for navigation" suggests otherwise. Appx65, Appx6066-6068.

B. The Board's contrary finding lacks evidentiary support.

The Board's determination that Wise discloses the recited "content descriptor" through its HTML "tags," Appx67-68, is not supported by substantial evidence, and thus reversal is required on this issue as well.

First, notwithstanding the plain claim language and Parus' explanation, the Board never addressed or determined that Wise's tags are "associated with each said web site address." Appx116, Appx5978, Appx6065-6066, Appx65-68. And as shown above, *supra* pp. 53-54, there can be no substantial dispute that an HTML tag within a web page is not associated with the web site's URL. This alone should dispose of the Board's "content descriptor" determination.

Second, with respect to the association "with each said speech command," the Board credited Mr. Lipoff's testimony that, for speech commands to operate in Wise, "a user's natural speech recognition grammars are recognized by the system to retrieve information from a plurality of websites," wherein, "logically, a 'subject word or phrase' speech command such as 'Baltimore Orioles score' in Wise is information about the 'information to be retrieved.'" Appx67, Appx1139. That

testimony, however, does nothing to show that the Wise system teaches associating a "speech command such as 'Baltimore Orioles score'" with any tag. This is *not* evidence, therefore, that Wise's tags are associated with "each said speech command" for purposes of the '402 patent. Appx116. And the Board's rumination that some in-document text "designating stock symbol links" may have a coincidental thematic overlap with a hypothetical speech command requesting "today's stocks," Appx67, Appx6018, likewise does not support Google's position. That rumination appears to involve *text*, not *tags*. And coincidental thematic overlap is *not* systemic "association." Again, therefore, that hypothetical is *not* evidence that Wise teaches associating a subject word or phrase with a navigational tag.

Indeed, Wise teaches no such thing. Instead, Wise discloses that, once the web page has been selected and downloaded, the system may use a tag to "navigate the document" such that, "if a user inputs an additional command corresponding to a stock symbol, the system may skip ahead to the symbol and begin 'reading' at the location of the stock symbol." Appx1137-1138 (2:60, 3:5-8). That is *not* disclosure of an association between the "subject word or phrase" *initially* used to select the web page, Appx1139 (6:17, 31-51), and the "HTML … tags" that may *subsequently* be used "to navigate the document," Appx1137 (2:60-63). Again, therefore, the Board's hypothetical "today's stocks" thought experiment provides *no* evidence that Wise's tags are associated with "each said speech command." Appx116.

Third, with respect to the requirement that the content descriptor "pre-defin[e] a portion of said web site containing said information to be retrieved," the Board agreed with Google's argument that, "importantly, no before/after temporal requirement is disclosed" in the '402 patent. Appx66-67. This simply misreads the claim language. Claim 1 requires a "speech command" that is associated with "a plurality of web sites" containing "information to be retrieved." Appx116 (claim 1). By logical necessity, that association must come *before* any web page is selected, downloaded, and processed. Appx67, Appx6065-6068. Claim 2 provides that this same "speech command" is further associated with a "content descriptor" that is in turn associated with the "address" of "each said web site" containing that information to be retrieved. Appx116 (claim 2). By the same logical necessity, that association must also come *before* any web page is selected, downloaded, and processed. Finally, Claim 2 provides that this content descriptor—already associated with the relevant speech command and the relevant addresses of each of the web sites containing the information to be retrieved—"pre-defin[es] a portion of said web site containing said information to be retrieved." Appx116 (claim 2).

The so-called "before/after temporal requirement" is thus baked into the claim itself. By operation of the claim's plain language, the content descriptor, which pre-defines the portion of the web site that contains the information to be retrieved, must be associated with both "said speech command" *and* "each said web site address"

before any web page is selected, downloaded, and processed. There is no dispute that Wise's HTML tags *do not* meet this requirement. Appx67, Appx6065-6068.

For this reason as well, the Board's obviousness determination is unsupported, cannot stand, and should be reversed. *See TQ Delta*, 942 F.3d at 1361 (reversing where the Board's obviousness determination rested on insufficiently supported "findings regarding the scope and content of the prior art"). Because the "content descriptor" limitation is recited in claim 2 and also in claims 9-15 of the '402 patent, Appx116, the Board's error on this limitation applies to and undermines its determination on each of those challenged claims, Appx75-76.

CONCLUSION

For these reasons, the final written decisions should be reversed. Or, in the alternative, they should be vacated and remanded for further proceedings.

Respectfully submitted,

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ADDENDUM

PARUS HOLDINGS, INC. V. GOOGLE, LLC

Nos. 23-2296, 23-2297

APPELLANT'S ADDENDUM

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Patents

Trials@uspto.gov
571-272-7822

Paper 31
Entered: August 1, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

PARUS HOLDINGS, INC.,
Patent Owner.

IPR2022-00358
Patent 7,881,941 B2

Before DAVID C. McKONE, PATRICK M. BOUCHER, and STACEY G. WHITE, *Administrative Patent Judges*.

BOUCHER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

In response to a Petition (Paper 1, "Pet.") filed by Google LLC ("Petitioner"), we instituted an *inter partes* review of claims 1–15 of U.S. Patent No. 7,881,941 B2 (Ex. 1001, "the '941 patent"). Paper 7 ("Dec."). During the trial, Parus Holdings, Inc. ("Patent Owner") filed a Response

(Paper 12, "PO Resp."), to which Petitioner filed a Reply (Paper 18, "Reply") and Patent Owner filed a Sur-reply (Paper 21, "Sur-reply"). An oral hearing was held with the parties, and a copy of the transcript was entered into the record. Paper 30 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, Petitioner has shown, by a preponderance of the evidence, that claims 1–15 are unpatentable.

I. BACKGROUND

A. The '941 Patent

The '941 patent relates to a "system that allows users to browse web sites and retrieve information by using conversational voice commands." Ex. 1001, 1:24–27. Figure 1 of the '941 patent is reproduced below.

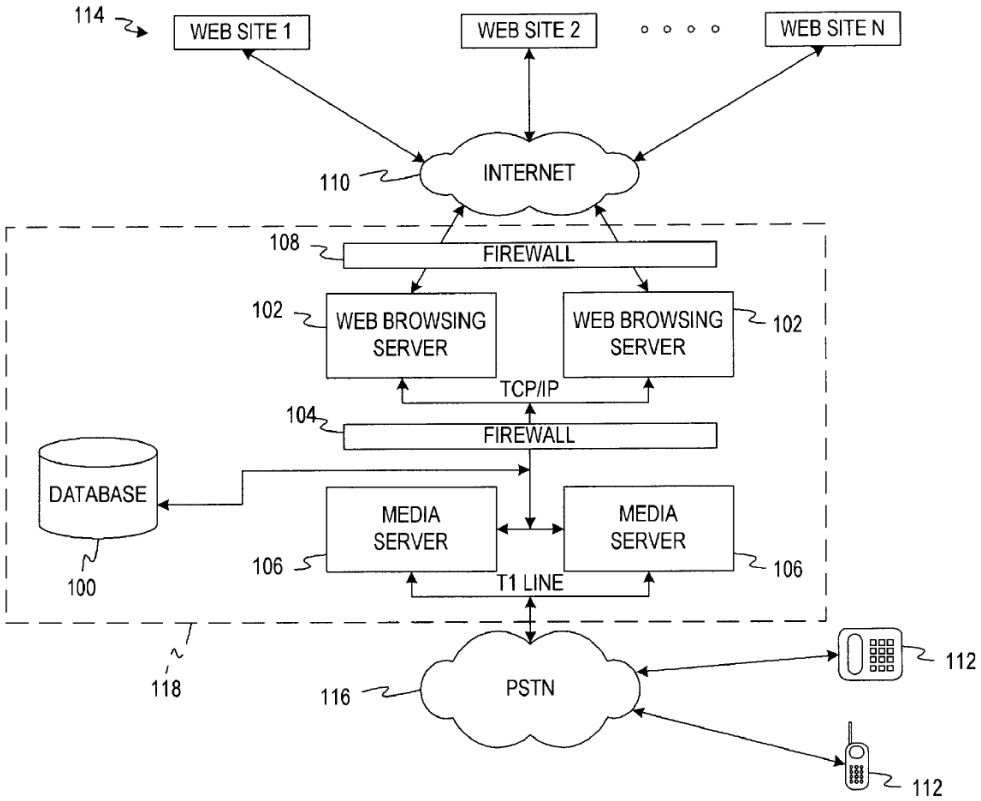

FIG. 1

Figure 1 is a block diagram depicting a "voice browsing system." *Id.* at 4:14–15. The system includes database 100 connected to web browsing servers 102 and media servers 106. *Id.* at 4:62–65. Web browsing servers 102 provide access to a network like Internet 110, via which web sites 114 may be accessed. *Id.* at 6:59–65.

Voice commands may be provided by a user to voice-browsing system 118 using public switched telephone network ("PSTN") 116 and establishing a connection between the user's voice enabled device 112 and media server 106. *Id.* at 15:23–28. Once the connection is established, media server 106 initiates an interactive voice response application that presents the user with a list of options based on the available web-site categories, from which the user makes selections by speaking into voice enabled device 112. *Id.* at 15:28–36. The user's speech commands are

converted into data messages that are sent to a "network interface system," such as a "web browsing server" that "then accesses the appropriate information source, such as a web site, to gather information requested by the user." *Id.* at 4:51–56.

"A preferred embodiment of the voice browser system and method uses a web site polling and ranking methodology that allows the system to detect changes in web sites and adapt to those changes in real-time." *Id.* at 3:56–59. Thus, database 100 contains a separate set of records for each web site accessible by the system, with each web site record containing (1) a "rank number" of the web site, (2) the associated uniform resource locator ("URL") for the web site, (3) a timestamp indicating the last time the web site was accessed, and (4) a command that enables format-specific communication with the web site. *Id.* at 5:1–10. In addition, database 100 categorizes each database record according to the "type" (and perhaps subtype) of information provided by each web site, such as "weather" or "stock" information. *Id.* at 5:10–27. In responding to a user voice command, media server 106 uses recognition results generated by a speech-recognition engine to retrieve a web site record from database 100 that can provide responsive information, particularly the highest-ranked web site record in the appropriate category. *Id.* at 6:39–50.

A "polling mechanism continually polls or 'pings' each of the sites listed in the database 100." *Id.* at 16:40–51. Web browsing server 102 sends brief data requests to each site listed in database 100 and monitors the response to determine whether it is complete and in the expected format. *Id.* at 16:42–48. Polled web sites that provide a complete response in the expected format "have their ranking established based on their 'response

time'" so that web sites with faster response times are ranked higher than those with slower response times. *Id.* at 16:48–53. "If the web browsing server 102 receives no response from the polled web site or if the response received is not in the expected format, then the rank of that web site is lowered." *Id.* at 16:53–56.

B. Illustrative Claim

Challenged independent claim 1 recites a method, with claims 2–8 dependent therefrom, and challenged independent claim 9 recites a corresponding system, with claims 10–15 depending therefrom. Claim 1 is reproduced below as representative.

> 1. A method for retrieving information from pre-selected web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:
>
> providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;
>
> providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;
>
> providing at least one instruction set stored in a database operatively connected to said computer, said instruction set comprising:
>
> a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;
>
> providing a speech command to said speaker-independent speech recognition engine, said speech command corresponding to said instruction set;

> said speaker-independent speech recognition engine assigning said speech command to a recognition grammar, said speech command and said recognition grammar corresponding to said instruction set;
>
> transmitting said speech command to said speaker-independent speech recognition engine;
>
> said speaker-independent speech recognition engine receiving said speech command and selecting the corresponding recognition grammar upon receiving said speech command;
>
> said computer retrieving said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition engine;
>
> said computer accessing at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer first accessing said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;
>
> said speech synthesis engine producing an audio message containing any retrieved information from said pre-selected web sites; and
>
> said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

Id. at 19:30–20:10.

C. Evidence

Petitioner relies on the following references:

Kovatch	WO 01/50453 A2	July 12, 2001	Ex. 1004
Burrows	US 5,765,149	June 9, 1998	Ex. 1006
Wise	US 5,884,262	Mar. 16, 1999	Ex. 1007
Neal	US 6,324,534	Nov. 27, 2001	Ex. 1010
Shaffer	US 5,950,165	Sept. 7, 1999	Ex. 1011

In addition, Petitioner relies on Declarations by Stuart J. Lipoff, P.E. Exs. 1002, 1050. Mr. Lipoff was cross-examined by Patent Owner, and a transcript of his deposition was entered into the record. Ex. 2061. Patent Owner relies on a Declaration by Randy Winters. Ex. 2063. Mr. Winters was cross-examined by Petitioner, and a transcript of his deposition was entered into the record. Ex. 1052.[1]

D. Instituted Grounds of Unpatentability

We instituted review of claims 1–15 on the following grounds. Dec. 8, 46; *see* Pet. 1–2.

Claim(s) Challenged	35 U.S.C. §[2]	References
1–5, 9, 10, 13, 14	103(a)	Kovatch, Neal
6–8, 11, 12, 15	103(a)	Kovatch, Neal, Burrows
1, 2	103(a)	Wise, Shaffer
3–15	103(a)	Wise, Shaffer, Burrows

[1] The parties also filed evidence related to Patent Owner's arguments for antedating Kovatch. This includes Declarations by Hal Poel and Alex Kurganov, filed by Patent Owner, Exs. 2043, 2052; cross-examination testimony of Messrs. Poel and Kurganov, filed by Petitioner, Exs. 1051, 1053; a Declaration by Martin G. Walker, Ph.D., filed by Petitioner, Ex. 1048; and cross-examination testimony of Dr. Walker, filed by Patent Owner, Ex. 2065. As we explain below, we do not reach Patent Owner's antedating arguments, and therefore do not consider this additional testimonial evidence in detail.

[2] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C § 103(a). The '941 patent was filed on February 13, 2008, and claims the benefit of the filing date, through a series of continuation applications, of February 5, 2001, as well as the benefit of even earlier provisional applications. Ex. 1001 at codes (22), (60), (63). We accordingly apply the pre-AIA version of § 103(a) herein.

E. Real Parties in Interest

The parties identify only themselves as real parties in interest. Pet. 14 (as numbered for introductory material); Paper 4, 2.

F. Related Matters

Both parties identify *Parus Holdings, Inc. v. Google, LLC*, No. 5:22-cv-7830 (N.D. Cal.) (formerly 6:21-cv-00571 (W.D. Tex.)) as a related matter. Pet. 14 (as numbered for introductory material); Paper 4, 2; Paper 29, 1. Petitioner additionally identifies the following district court matters (all of which have been dismissed) as related: (1) *Parus Holdings, Inc. v. Microsoft Corp.*, No. 2:22-cv-1700 (W.D. Wash.) (formerly 6:21-cv-00570 (W.D. Tex.)); (2) *Parus Holdings, Inc. v. Apple Inc.*, No. 3:22-cv-07514 (N.D. Cal.) (formerly 6:21-cv-00968 (W.D. Tex.)); and (3) *Parus Holdings, Inc. v. Samsung Electronics America, Inc.*, No. 6:21-cv-01073 (W.D. Tex.). Pet. 14 (as numbered for introductory material); Paper 29, 1.

Petitioner additionally identifies the following *inter partes* reviews as involving patents related to the '941 patent: IPR2020-00686, IPR2020-00687, IPR2020-00846, IPR2020-00847, IPR2022-00137, IPR2022-00279, IPR2022-00355; IPR2022-00523. Pet. 14–16 (as numbered for introductory material); Paper 29, 2–3.

II. ANALYSIS

A. Legal Principles

A claim is unpatentable for obviousness under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are "such that the subject matter as a whole would have been obvious at the time

the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective indicia of nonobviousness, i.e., secondary considerations.[3] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")); *see In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The "person of ordinary

[3] The parties do not address objective indicia of nonobviousness, which accordingly do not form part of our analysis.

skill in the art" is a hypothetical construct, from whose vantage point obviousness is assessed. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998). "This legal construct is akin to the 'reasonable person' used as a reference in negligence determinations" and "also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan." *Id.* (citing *In re Carlson*, 983 F.2d 1032, 1038 (Fed. Cir. 1992)).

Petitioner proposes that a person of ordinary skill in the art "would have had a Bachelor's degree in electrical engineering, computer science or a related field, and at least two years of experience with voice interfaces and information processing." Pet. 4–5. Petitioner adds that "[m]ore education could substitute for less experience, and vice versa." *Id.* Mr. Lipoff supports this articulation, and neither Patent Owner nor Mr. Winters proposes any different articulation. *See* Ex. 1002 ¶ 74; Ex. 2063 ¶ 41 (Mr. Winters stating factors considered in defining a person of ordinary skill in the art, without stating the education or experience held by such a person).

Because we find Petitioner's proposal reasonable, uncontroverted, consistent with the level of skill reflected by the prior art, and supported by Mr. Lipoff's testimony, we adopt it for purposes of this Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art may reflect an appropriate level of skill in the art).

C. Claim Construction

The Board uses "the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary

meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." 37 C.F.R. § 42.100(b) (2019); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). Neither party proposes any express construction of any term. Pet. 5 ("Petitioner does not believe that any express constructions are necessary to resolve the invalidity issues presented in this petition"); PO Resp. 1 ("Patent Owner believes that claim construction is unnecessary and all terms of the Challenged Claims should be given their plain and ordinary meanings.").

On the record before us, we do not find it necessary to construe any term for purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) ("[W]e need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Challenges Based on Wise and Shaffer

Petitioner challenges claims 1 and 2 as unpatentable under 35 U.S.C. § 103(a) over Wise and Shaffer; and challenges claims 3–15 as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 40–66.

1. Overview of the Prior Art

a. Wise

Wise "relates to accessing information from a computer network via a telephone . . . or other audio device." Ex. 1007, 1:6–9. Figure 2 of Wise is reproduced below.

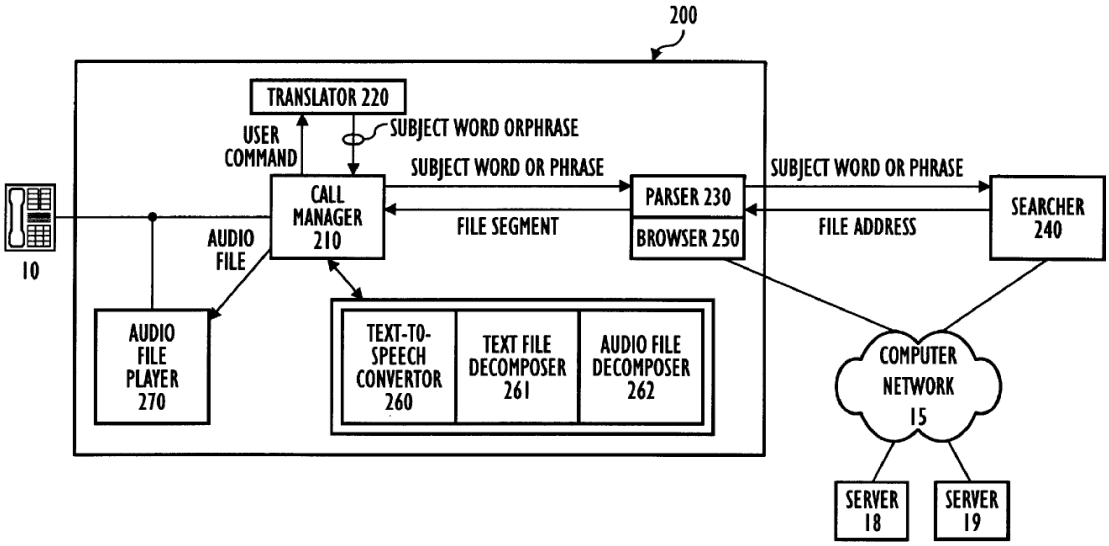

FIG. 2

Figure 2 is a block diagram illustrating a system architecture in which telephone 10 is connected via a telephone line to system 200, which is connected through computer network 15 to various servers 18, 19. *Id.* at 3:55–58, 5:38–45. Network 15 may be the Internet, and servers 18, 19 may be web servers. *Id.* at 3:55–58. User voice commands from telephone 10 may be captured by Call Manager 210 and translated by a speech-to-text engine embodied by translator 220. *Id.* at 6:14–30. "Generally, the system will attempt to interpret the user command and then attempt to navigate based on the command." *Id.* at 6:31–33.

A subject word or phrase derived from the user command is passed to Call Manager 210, which routes the information to Parser 230, which may send the subject word or phrase to Searcher 240 to find addresses of files on target computer network 15. *Id.* at 6:33–46. Parser 230 passes an address to Browser 250, which establishes a connection to appropriate server 18 through network 15 so that Browser 250 may download a requested file to be returned to Parser 230. *Id.* at 7:7–13. Parser 230 dynamically analyzes

the structure and contents of the downloaded file, and passes the structure type and associated text or audio content to Call Manager 210, which routes it for creation of an audio file to be played by audio file player 270. *Id.* at 7:13–37.

Wise describes how "a network search engine may be provided to investigate documents located on a relatively unconstrained network such as the World Wide Web in order to locate documents which are highly compatible with audio presentation of even documents which are specifically labeled to be compatible." *Id.* at 9:56–61. To do so, the search engine may be a "worm type searcher or other robotic search engine," allowing the document search to be automated "along with the process of indexing such documents." *Id.* at 9:61–66. Parser 230 and Call Manager 210 may interrogate found documents to determine whether they reach a threshold level of audio compatibility. *Id.* at 10:2–6. Compatible documents may be indexed, with the index "stored as one or more documents preferably in a hierarchical order." *Id.* at 10:7–9. "The user may use the navigation commands to traverse the index and invoke a link to a source document." *Id.* at 10:9–10.

b. Shaffer

Shaffer "relates to methods and systems for using directory assistance inquiries," particularly with "voice navigation through queued options using voice response units." Ex. 1011, 1:8–11. Figure 5 of Shaffer is reproduced below.

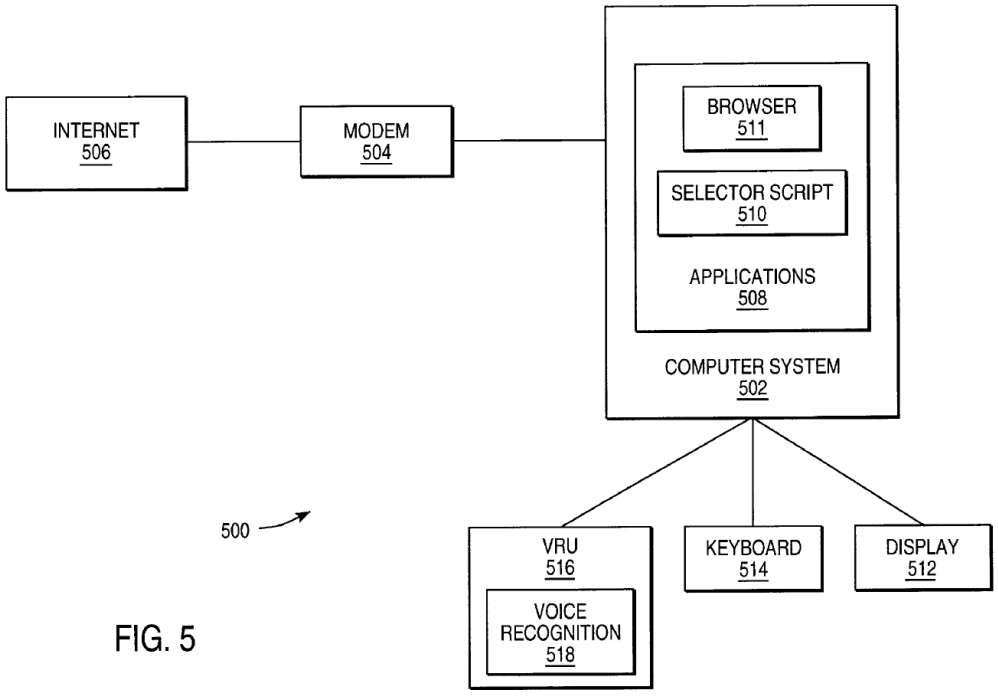

FIG. 5

Figure 5 is a block diagram illustrating a system for use on the Internet. *Id.* at 2:4–5, 5:26. Computer system 502 connects via modem 504 to Internet 506, and runs applications 508 that include selector script 510 and browser 511. *Id.* at 5:27–29. Computer system 502 also connects to display 512, keyboard 514, and voice response unit 516, which includes voice recognition unit 518. *Id.* at 5:30–32.

Shaffer explains that, when a "user inquires about web sites," such as with a "voice search request" or "saved from a previous session," browser 511 supplies a list of sites that can be recited or displayed on display 512. *Id.* at 5:34–39. After an opportunity to pare the list, the system proceeds through the list, providing the user with an opportunity to visit each site. *Id.* at 5:39–6:29 ("[T]he method . . . inquires of the user . . . whether he wishes to visit the next site"). At each substep, the user is asked whether he is satisfied and, if not, whether the user wishes to visit the next site on the list. *Id.* at 6:6–12. This is repeated as the user proceeds through the list,

until the user is satisfied or the end of the list is reached. *Id.* at 6:3–6, 6:25–29.

c. Burrows

Burrows relates to "ranking records of a database which have been located by searching an index to the database, and more particularly to ranking the records for presentation based on the content of the records." Ex. 1006, 1:5–8. Burrows particularly describes applications in which the database records are Internet web pages and in which a search engine identifies pages of interest. *Id.* at 3:29–44, 56–61. Because of the large number of web pages that can be qualified by search queries, Burrows expresses a "desire[] to present search results in a usable manner so that users are not burdened with perusing all qualifying records." *Id.* at 1:47–49.

Figure 2 of Burrows is reproduced below.

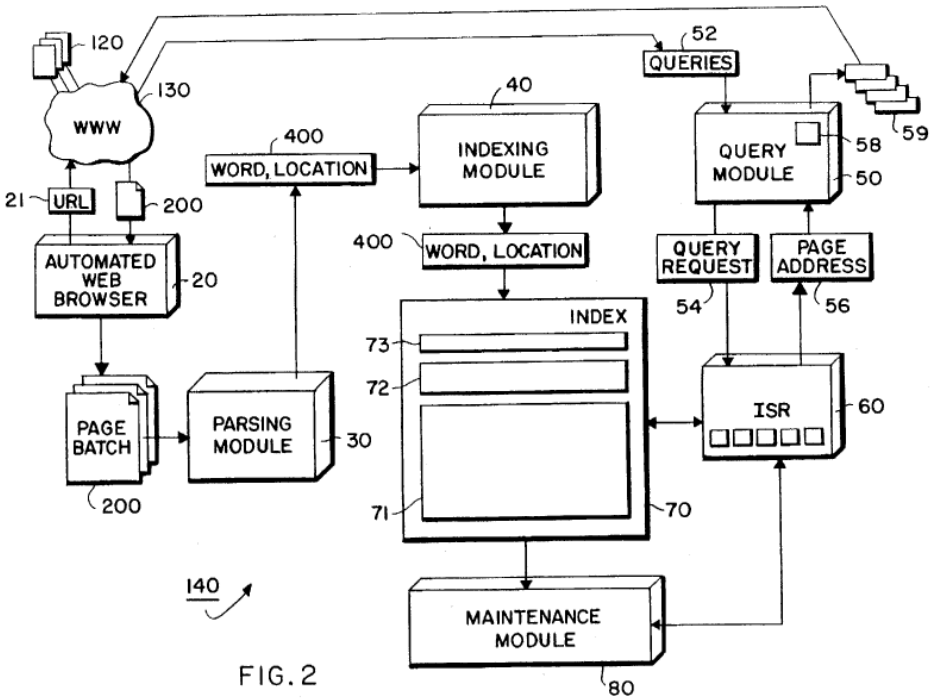

FIG. 2

Figure 2 is a block diagram of a search engine, including an index. *Id.* at 2:27–28. Search engine 140 includes automated web browser 20, parsing module 30, indexing module 40, query module 50, index stream readers 60, index 70, and maintenance module 80. *Id.* at 4:9–13. Automatic web browser 20 periodically sends out requests 21 over network 130 so that sites 120 return records or pages 200. *Id.* at 4:16–20. Parsing module 30 breaks down portions of information of pages 200 into fundamental indexable elements or atomic pairs 400. *Id.* at 4:31–33. Indexing module 50 sorts pairs 400 to generate index 70. *Id.* at 4:46–48.

Query module 50 analyzes queries 52 provided by users to generate query requests 54, which invoke index stream readers 60 to sequentially scan data structures 71–73 within index 70. *Id.* at 5:15–16, 5:25–31. Addresses 56 of pages qualified by the queries are thereby identified so that information 59 about the qualifying pages may be delivered to users by presentation module 58. *Id.* at 5:32–35.

Because the number of pages indexed by search engine 140 may be large, "there needs to be a way to rank order the list in a meaningful manner." *Id.* at 27:23–29. Ranking may be performed by assigning a weight *w* to each indexed word, with a score *W* for a page being equal to the sum of the weight *w* for each occurrence of a word specified in the query (or absence of the word if an exclusionary query was used). *Id.* at 27:35–39. Figure 22 of Burrows is reproduced below.

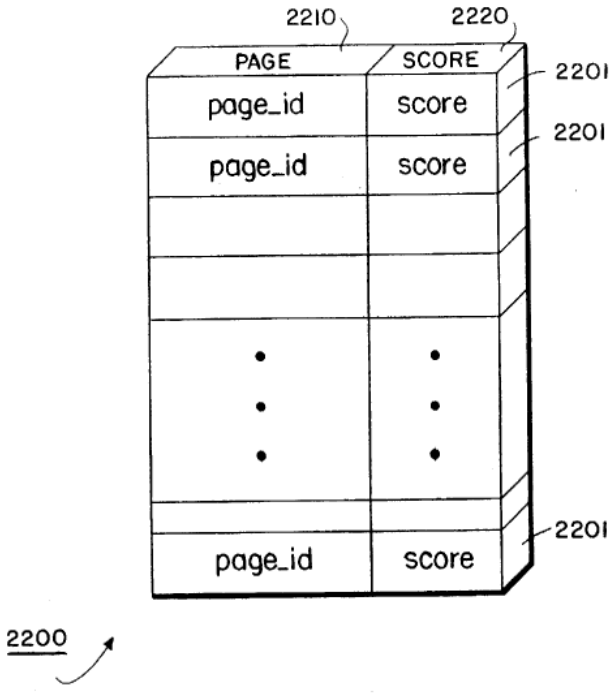

Figure 22 is a block diagram that illustrates a ranking list of qualified pages, with each entry 2201 including identification 2210 of a qualified page and score 2220 associated with that qualified page. *Id.* at 2:66, 28:19–24. Entries 2201 are maintained in rank order according to scores 2220.

2. Summary of Challenges

Petitioner's challenges on these grounds rely primarily on Wise, which Petitioner characterizes as disclosing a "system [that] accesses websites to retrieve user-requested information." *Id.* at 42. Nevertheless, Petitioner acknowledges that Wise "does not disclose sequentially/ subsequently accessing websites until information is found," and relies on Shaffer for limitations related to such a feature. *Id.* Petitioner also acknowledges that the combination of Wise and Shaffer "does not explicitly disclose adjusting ranking and polling," which are features related to limitations of all claims except claims 1 and 2. *Id.* at 58; *see* Ex. 1001,

19:30–22:28 (claims of the '941 patent). For such features, Petitioner further relies on Burrows, which Petitioner describes as "disclos[ing] polling." Pet. 58.

With respect to combining the teachings of Shaffer with those of Wise, Petitioner specifically contends that an ordinarily skilled artisan "would have been motivated to apply Shaffer's sequential search technique when retrieving information from websites in Wise's ranked index, to maximize the likelihood of finding the desired information and efficiently use computing resources by searching in the most likely sources first." *Id.* at 44–45 (citing Ex. 1002 ¶ 214). With respect to further adding the teachings of Burrows to such a combined system, Petitioner contends that such an ordinarily skilled artisan "would have found it obvious to apply Burrows's teachings of presenting 'higher rank[ed]' pages to the user first, adjusting rank, and periodically polling websites to check for updated information to Wise/Shaffer's sequentially searched index to better identify and keep updated the records of the most interest to the user." *Id.* at 59 (citing Ex. 1006, 1:47–49, 3:56–58, 27:22–32; Ex. 1002 ¶ 251). Petitioner supports its reasoning for effecting the combination of teachings of Shaffer with those of Wise, and for further effecting the combination of teachings of Burrows with the Wise-Shaffer combination, with Mr. Lipoff's testimony. Ex. 1002 ¶¶ 214, 251. That reasoning is supported with rational underpinning, and is not disputed by Patent Owner. We accordingly determine that Petitioner sets forth sufficient rationale to support the combinations underlying its analysis of each of the challenged claims.

3. Independent Claim 1

Petitioner provides an element-by-element analysis to support its contention that independent claim 1 is unpatentable under 35 U.S.C. § 103(a) over Wise and Shaffer, and supports that analysis with Mr. Lipoff's testimony. Pet. 45–57; Ex. 1002 ¶¶ 216–245. Petitioner relies on Wise's architecture, particularly its speech-to-text and text-to-speech converters, and its ability to receive audio commands from users and to retrieve information from web sites that can be provided as audio responses to those commands. *See generally* Pet. 45–57. As part of that analysis, Petitioner relies on Mr. Lipoff's testimony that a person of ordinary skill in the art "would have understood that Wise teaches assigning a speech command to a recognition grammar because it determines what the user is saying based on a received command, recognizes that it applies to one of the many potential grammars, and assigns the corresponding entry in the recognition grammar database to the command." *Id.* at 52 (citing Ex. 1002 ¶ 233). To address the claim's requirements for sequentially accessing web sites until the information to be retrieved is found, Petitioner relies on Shaffer's disclosure of sequential access of multiple web sites. *Id.* at 55–56. For these requirements, Petitioner also relies on Mr. Lipoff's testimony to support its position that a person of ordinary skill in the art would have been motivated to combine the teachings of Wise and Shaffer in a manner that meets the corresponding limitations. *Id.* (citing Ex. 1002 ¶ 243).

Patent Owner disputes two aspects of Petitioner's analysis, which we address in detail below.

a. "pre-selected web sites" and "pre-selected web site addresses"

The preamble of independent claim 1 recites "[a] method for retrieving information from *pre-selected web sites* by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device." Ex. 1001, 19:30–33 (emphasis added). And the body of the claim further recites "*a plurality of pre-selected web site addresses*, each said web site address identifying a web site containing information to be retrieved." *Id.* at 19:45–47 (emphasis added). The parties' dispute, for both the preamble recitation and the body limitation, is whether Wise discloses a plurality of preselected web sites (or web site addresses) from which the recited information is retrieved. *See* Pet. 45–46, 51; PO Resp. 74–77; Reply 2–6; Sur-reply 1–4.

The parties broadly agree on the relevant functionality of Wise. *See* Reply 2 (Petitioner summarizing areas of agreement). Specifically, Wise has two modes for website retrieval, one that relies on memory storage and one that relies on searching:

> Generally, the system will attempt to interpret the user command and then attempt to navigate based on the command. Once the numeric, alphanumeric, or voice command information from the telephone 10 is translated, the subject word or phrase is passed to the Call Manager 210. *At this point, the user may choose to invoke a search for related file addresses on the computer network. Otherwise, a predetermined audio-compatible address is selected by the system.* The Call Manager 210 then routes this information to the Parser 230, which is a sophisticated software program. The Parser may either match a predetermined file address, stored in memory, to the subject word or phrase or send the subject word or phrase to Searcher 240, which could be a computer program such as Lycos™ or Web Crawler™, to find addresses of files

> on a target computer network 15 relating to the subject word or phrase.

Ex. 1007, 6:31–46 (emphasis added). According to Patent Owner, in the first mode (memory storage), "Wise discloses a clear **one-to-one relationship** between a subject word or phrase (speech command) and a predetermined file address." PO Resp. 75 (citing Ex. 2063 ¶ 306). Patent Owner's expert, Mr. Winters, similarly asserts that such a one-to-one relationship is "clear." Ex. 2063 ¶ 306. We do not find Wise's disclosure to be clearly limited to such a one-to-one relationship, and neither Patent Owner nor Mr. Winters elaborates on how their inference is "clear." *See* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Petitioner disagrees that Wise's first mode is limited to a one-to-one relationship between the speech command and a predetermined file address, and points to multiple pieces of evidence to support its position. In particular, Petitioner notes that Wise's claim 8 explicitly uses the plural in reciting "a computer memory connected to the parser for storing predetermined file addresses." Pet. 51; Reply 3; Ex. 1007, 10:66–11:2. According to Petitioner, "Wise thus plainly discloses that there may be more than one predetermined website address in the Parser." Reply 3. Mr. Lipoff's direct testimony supports this understanding of Wise. Ex. 1002 ¶ 230 ("Wise's disclosures indicate that a plurality of predetermined web addresses are stored and ranked in the system."). In addition, Petitioner directs our attention to Patent Owner's statement in another *inter partes*

review involving Wise that "Wise does disclose predetermined file addresses stored in a computer memory that is connected to the Parser." *Id.*; Ex. 1054, 33.

Patent Owner counters that Petitioner's argument "is made in isolation from the other claim limitations of Claims 1 and 9 [of the '941 patent]." Sur-reply 1. According to Patent Owner, "[w]hen considering Claims 1 and 9 [of the '941 patent] in full, each one of the websites identified by each address in the 'plurality of pre-selected web site addresses' is identified by an instruction set **as a site that includes the information of interest**." *Id.* Patent Owner elaborates that claims 1 and 9 of the '941 patent require accessing web sites until it is determined that "said information to be retrieved" is found, such that "each of the websites may be accessed to obtain the **same** 'said information to be retrieved.'" *Id.* at 2. Although we agree with this characterization of the '941 patent's independent claims, we disagree with Patent Owner's assertion that Petitioner's reliance on Wise's claim 8 "fails to consider these aspects, and indeed the full scope, of Claims 1 and 9 and instead considers only specific elements in isolation." *See id.* at 3.

Petitioner's reliance on Wise's claim 8 bears specifically on Petitioner's contention that Wise "plainly discloses that there may be more than one predetermined website address in the Parser," and is not inconsistent with Patent Owner's characterization of the '941 patent's independent claims. *See* Reply 3. Petitioner's position is directly contrary to Patent Owner's regarding Wise's disclosure, and Petitioner relies on Wise's claim 8 to support its position. *See* Sur-reply 3 (Patent Owner

reiterating its presumption that "Wise discloses a one-to-one match between a 'subject word or phrase' and a file address").

Mr. Lipoff's testimony is instructive on this point. Mr. Lipoff described Wise's functionality on cross-examination as storing websites previously found by the searcher as "preselected websites" in local memory. *See* Ex. 2061, 147:18–148:19.[4] According to Mr. Lipoff, this allows Wise's system to attempt to select one of such preselected websites from local memory with its first mode. *Id.* at 147:18–148:1 ("So the capability within Wise that's disclosed where I point to a [*sic*] preselected websites which are stored, would be in the memory of the parser without a need to invoke going to the search, which would return websites, but the preselected ones would be stored in the memory of the parser.").

Patent Owner discounts Petitioner's position as an attempt to "blend" Wise's first and second modes using hindsight, and seeks to capitalize on a statement by Mr. Lipoff during cross-examination that Patent Owner characterizes as "Mr. Lipoff stat[ing] that he only relies on the Wise option 1 and **does not rely** on the Wise option 2 (the index search)." PO Resp. 76–77; *see* Ex. 2061, 144:17–145:5 (Mr. Lipoff testifying: "No. I -- I would not agree, because you're talking about a part of the Wise embodiment that I did not rely upon. The Wise embodiment, as described in the text, but I'll refer to figure 2, includes two different places in which web addresses could reside. And what I'm relying upon is a disclosure in Wise that the parser has

[4] Mr. Lipoff added that "it's not clear that that's the only way in which the preselected websites may get in the parser," but speculative alternative ways of adding preselected websites to local memory are not germane to the issues before us. *See* Ex. 2061, 148:7–9.

memory that can have a list of a [*sic*] web addresses, not relying upon anything that happens between box 200 in figure 2 and the searcher.").

We have reviewed Mr. Lipoff's deposition testimony, and do not find that Mr. Lipoff recanted his direct-testimony reliance on both of Wise's modes in forming his opinions. Rather, we agree with Petitioner that Mr. Lipoff's testimony "is that, how the preselected websites are stored into the Parser memory in the first place, whether from the Searcher or otherwise, is not important to his opinion regarding Wise's teachings of 'preselected websites.'" Reply 5 (citing Ex. 1007, 5:32–33; Ex. 1050 ¶¶ 9–10). Furthermore, Mr. Lipoff clarified his opinions in a Reply Declaration that Patent Owner declined to cross-examine. Ex. 1050 ¶¶ 7–11 (Mr. Lipoff testifying to Wise's functionality); Tr. 43:5–18 (Patent Owner's counsel confirming at oral argument that Patent Owner did not cross-examine Mr. Lipoff on his Reply Declaration).

Weighing the evidence, we determine that Petitioner sufficiently shows that Wise discloses, through at least its first mode (memory storage), "[a] method for retrieving information from pre-selected web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device," as recited in the preamble of independent claim 1. *See* Pet. 45–46; Ex. 1001, 19:30–33. Because we determine that Petitioner sufficiently shows that Wise meets the preamble recitation, we need not determine whether the preamble is limiting. We also determine that Petitioner sufficiently shows that Wise discloses, through at least its first mode (memory storage), "a plurality of pre-selected web site addresses, each said web site address

identifying a web site containing said information to be retrieved," as recited in the body of independent claim 1. *See* Pet. 51; Ex. 1001, 19:45–47.

b. Sequential Access

Independent claim 1 recites

> said computer accessing at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer first accessing said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed.

Ex. 1001, 19:64–20:5. For this "sequential access" limitation, Petitioner relies on Shaffer's disclosure of sequentially accessing websites according to a list, until a user is satisfied with what has been returned or the list is exhausted. Pet. 55–56. Supported by Mr. Lipoff's testimony, Petitioner reasons that a person of ordinary skill in the art would combine Shaffer's sequential access technique with Wise's system "because it would have been beneficial to maximize the likelihood of finding the desired information more quickly and efficiently use computing resources, by searching in the most likely sources first, and proceeding through Wise's index list until the user is satisfied or the list is exhausted." *Id.* at 56 (citing Ex. 1002 ¶ 243).

Patent Owner does not specifically dispute Petitioner's reasons for effecting the combination of teachings from Wise and Shaffer, which we find sufficiently articulated and supported; instead, Patent Owner contends that the combination does not meet the sequential access limitation. *See* PO Resp. 78 ("Assuming, *arguendo*, this is a combination a [person of

ordinary skill in the art] would consider, this combination does not disclose this claim limitation."). Patent Owner makes two points in this respect.

First, Patent Owner reiterates its contention, addressed above, that "Mr. Lipoff expressly **does not rely** on the Wise search index (option 1) for his opinion of the Wise disclosure of a plurality of websites." PO Resp. 78. For the reasons we discuss in the preceding subsection, we agree with Petitioner that Patent Owner's argument relies on "a misinterpretation of out-of-context deposition testimony." Reply 6. As Petitioner adds, Wise discloses that an "index may be stored as one or more documents preferably in a hierarchical order" and "[t]he user may use the navigation commands to traverse the index and invoke a link to a source document." *Id.* at 8; Ex. 1007, 10:7–10.

Second, Patent Owner takes the position that the claim language precludes user interaction or instructions during the process of the sequential search. *See* PO Resp. 80. But Patent Owner provides insufficient evidentiary support for that position, and we agree with Petitioner that Patent Owner's interpretation invokes a negative limitation that is unsupported by the plain and ordinary meaning of the claim language. *See* Reply 8. "While a negative limitation need not be recited in the specification *in haec verba*, there generally must be something in the specification that conveys to a skilled artisan that the inventor intended the exclusion." *Novartis Pharm. Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1017 (Fed. Cir. 2022). In this instance, both parties and both experts agree that the specification of the '941 patent is silent with respect to user participation during sequential access. PO Resp. 81 (Patent Owner asserting that "[t]he '941 patent is silent as to the participation of a user in the sequential search process"); Ex. 2063 ¶

315 (Mr. Winters making same assertion); Reply 9 (Petitioner asserting that "[i]mporting a requirement that user interaction is precluded by the claims—a negative limitation, when the specification is wholly silent on it, would impermissibly narrow the scope of the claims, contrary to fundamental principles of claim interpretation"); Ex. 2061, 107:15–22 (Mr. Lipoff agreeing that "there's no specific mention of the user interacting" in the portion of the specification related to "the sequential search").[5]

Based on these facts, we find insufficient reason to exclude user interaction from the plain and ordinary meaning of the sequential access limitation. We thus determine that Shaffer—which clearly involves user interaction, *see* Ex. 1011, 6:3–29—meets the limitation. We also determine that Petitioner articulates sufficient reason, supported by rational underpinning, to achieve the combination of teachings it proposes. We accordingly determine that Petitioner makes a sufficient showing for the sequential access limitation.

[5] In its Sur-reply, Patent Owner asserts that "[a]s discussed in the [Patent Owner Response], the '941 specification teaches **against** the notion of user interaction in the claim limitations involving sequentially accessing." Sur-Reply 6 (citing PO Resp. 80–81). We disagree with this characterization of the Patent Owner Response, and treat this assertion as a new argument impermissibly raised for the first time in the Sur-reply. *See* 37 C.F.R. § 42.23(b) ("A sur-reply may only respond to arguments raised in the corresponding reply"). Regardless, even if we considered this argument, we would find it unpersuasive. Based on our independent review of the specification of the '941 patent, in agreement with both experts, and in agreement with other statements of both parties, we find the specification to be "silent" on user interaction. *See also* Tr. 48:25–49:23 (Patent Owner conceding at oral hearing that the specification "is silent" on this issue).

c. Summary

Petitioner's element-by-element analysis addresses all aspects of independent claim 1. Upon reviewing the entire record, including the evidence and arguments cited by both Petitioner and Patent Owner, we find Petitioner sufficiently demonstrates how the proposed combination teaches all of the limitations of independent claim 1. We conclude that Petitioner shows, by a preponderance of the evidence, that independent claim 1 is unpatentable under 35 U.S.C. § 103(a) over Wise and Shaffer.

4. Dependent Claim 2

Claim 2 depends from independent claim 1 and recites that "said instruction set further comprises a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved." Ex. 1001, 20:11–15. Petitioner challenges claim 2 as unpatentable under 35 U.S.C. § 103(a) over Wise and Shaffer. Pet. 57–58.

For the recited content descriptor, Petitioner points to "Wise['s] disclos[ure] that 'documents may contain content which is useful for navigation' such as 'tags' that 'designat[e] links or portions of a document,' like a webpage, for the system to 'attempt to navigate to a location corresponding to a user command and effect any action possible at that location.'" *Id.* at 57 (quoting Ex. 1007, 2:61–66). Mr. Lipoff supports Petitioner's contention that a person of ordinary skill in the art would have understood that software residing on the server IP uses Wise's documents with tags to execute the functionality of the recited "content descriptor." Ex. 1002 ¶ 246; *see* Pet. 58. With this evidence, Petitioner makes a

sufficient showing, and Patent Owner does not dispute these aspects of Petitioner's showing outside of its arguments directed at underlying independent claim 1.

We conclude that Petitioner shows, by a preponderance of the evidence, that dependent claim 2 is unpatentable under 35 U.S.C. § 103(a) over Wise and Shaffer.

5. Dependent Claims 3–5

Claim 3 depends from independent claim 1 and recites that "said instruction set further comprises a ranking from highest to lowest associated with each said web site, said ranking indicating the order in which the plurality of pre-selected web sites are accessed." Ex. 1001, 20:16–19. Claim 4 depends from claim 3 and adds that "said computer accesses said plurality of web sites based on said ranking, said computer first accessing said web site having the highest ranking." *Id.* at 20:20–22. Claim 5 depends from claim 4 and further adds "the step of adjusting said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings." *Id.* at 20:23–28. These three dependent claims are thus directed to features involving ranking of pre-selected web sites, and Petitioner challenges them as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 63.

For these ranking features, Petitioner relies on Burrows. *Id.* at 55–56 (claim 4), 60–61 (claim 3), 62 (claim 5), 63 (referring to analysis of similar limitations recited in independent claims 1 or 9). Specifically, for claim 3,

Petitioner reasons that "[a]n obvious implementation of the Wise/Shaffer combination would have been to include a ranking indicating the order in which the websites in Wise's ordered index are accessed, as Burrows teaches." *Id.* at 61. For claim 4, Petitioner relies on its analysis of the sequential access limitation discussed above in the context of independent claim 1. *Id.* at 55–56. And for claim 5, Petitioner notes that "Burrows discloses a system for ranking database records (e.g., webpages) that 'are presented to the users in a rank order where the pages having a higher rank are presented first.'" *Id.* at 62 (citing Ex. 1006, 3:39–33, 27:28–32, 32:14–47). Petitioner supports its analyses of these ranking dependent claims with testimony by Mr. Lipoff, and Patent Owner does not dispute these analyses outside of its arguments directed at underlying independent claim 1. Ex. 1002 ¶¶ 240–243, 258–259, 264–266.

Petitioner's analyses are sufficient, and we conclude that Petitioner shows, by a preponderance of the evidence, that dependent claims 3–5 are unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows.

6. Dependent Claims 6 and 7

Claim 6 depends from independent claim 1 and recites the additional "step of periodically polling each said web site to determine whether said web site contains said information to be retrieved." Ex. 1001, 20:30–32. Claim 7 depends from claim 6 and recites that "the computer periodically polls each said web site without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site, said computer

creating a ranking of said plurality of web sites based on said periodic polling." *Id.* at 20:33–40. These claims are thus directed to features involving polling of web sites, and Petitioner challenges both claims as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 63–64.

For these polling features, Petitioner relies on Burrows. *Id.* at 34–35 (claim 6), 35–37 (claim 7), 63–64 (referring to discussion of Burrows in analysis of Kovatch-Neal-Burrows combination). In particular, for claim 6, Petitioner points to Burrows's disclosure of its automated browser periodically sending requests over a network, with sites returning records or pages in response to those requests. *Id.* at 34 (citing Ex. 1006, 4:16–20). Petitioner further observes that Burrows states that "it may periodically be necessary to admit modified or new entries," and that "[m]odified pages can be handled as a delete and add operation." *Id.* (quoting Ex. 1006, 5:43–44, 13:43–45). Supported by Mr. Lipoff's testimony, Petitioner reasons that, in light of these disclosures, a person of ordinary skill in the art would have understood that "Burrows's automated browser 'polls' (checks) websites in the index to determine whether they still contain the information to be retrieved or have been modified such that they do not." *Id.* at 34–35 (citing Ex. 1002 ¶¶ 190–191).

For claim 7, Petitioner identifies the following functions performed by Burrows, without being instructed by the user: (1) periodically searching the Web to determine whether a previously indexed page is still active, i.e. "determin[ing] the availability of each web site"; (2) using a maintenance module to add and delete information from an index, i.e. "determin[ing] changes to the location of said information to be retrieved from each web

site"; and (3) logging the processing cost of each page, i.e. "determin[ing] the duration of time for each said web site to respond to a request." *Id.* at 35–37. Petitioner additionally reasons that inactive-page or location-of-information response would impact a ranking hierarchy because they involve "delete and add" operations, such as by decreasing the rank of an inactive website or adjusting the rank of a polled website based on changes to the location of information retrieved from each website. *Id.* at 36. Petitioner supports such reasoning with testimony by Mr. Lipoff. Ex. 1002 ¶¶ 193–196.

Petitioner's analyses for both claims 6 and 7 are sufficient, and are not disputed by Patent Owner outside of its arguments directed at underlying independent claim 1. We accordingly conclude that Petitioner shows, by a preponderance of the evidence, that dependent claims 6 and 7 are unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows.

7. Dependent Claim 8

Claim 8 depends from independent claim 1 and recites the additional "step of periodically searching said internet to find new web sites containing said information to be retrieved, and adding said new web sites to said plurality of web sites." Ex. 1001, 20:41–44. Petitioner challenges claim 8 as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 65.

For this feature, Petitioner again relies on Burrows. *Id.* at 37–38, 65 (referring to discussion of Burrows in analysis of Kovatch-Neal-Burrows combination). Again noting that Burrows discloses a maintenance module that may be used to add and delete information, Petitioner reasons that a

person of ordinary skill in the art "would have understood that web crawling to periodically search the Internet to identify new web sites and add them to a listing of websites (or index) was well-known and conventional." *Id.* at 38. Petitioner supports this reasoning with testimony by Mr. Lipoff, as well as corroborating support from U.S. Patent No. 6,418,433 B1. Ex. 1002 ¶¶ 197–200; Ex. 1032, 1:22–64. Petitioner's reasoning is sufficient, and is not disputed by Patent Owner outside of its arguments directed at underlying independent claim 1.

We accordingly conclude that Petitioner shows, by a preponderance of the evidence, that claim 8 is unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows.

8. Independent Claim 9

Independent claim 9 is a system claim that generally parallels the method recited in independent claim 1, but includes additional features that are recited in some of the dependent method claims, i.e. claims 2–. *Compare* Ex. 1001, 20:45–22:8 *with id.* at 19:30–20:28. Petitioner challenges independent claim 9 as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 60–63. In doing so, Petitioner relies on the same analysis discussed above for claims 1–5. *Id.* Patent Owner disputes that analysis only for the same reasons discussed above in connection with independent claim 1. *See* PO Resp. 74–81. For the same reasons discussed above in connection with claims 1–5, we determine that Petitioner makes a sufficient showing with respect to all limitations of independent claim 9.

We accordingly conclude that Petitioner shows, by a preponderance of the evidence, that independent claim 9 is unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows.

9. Dependent Claim 10

Claim 10 depends from independent claim 9 and recites that "said phone comprises a standard telephone, a cellular phone, or an IP phone." Ex. 1001, 22:9–10. In challenging this claim under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows, Petitioner identifies Wise's disclosure of "[a] standard telephone" that may be connected to its architecture. Pet. 65 (citing Ex. 1007, 3:51–61). Because this clearly meets the limitation, and is not disputed by Patent Owner outside of its arguments directed at underlying independent claim 9, we determine that Petitioner makes a sufficient showing.

We conclude that Petitioner shows, by a preponderance of the evidence, that dependent claim 10 is unpatentable under 35 U.S.C. § 103(a) over Wise, Burrows, and Shaffer.

10. Dependent Claims 11–13

Each of claims 11–13 depends from independent claim 9, respectively reciting that "said internet" is "a local area network," "a wide area network," and "the Internet." Ex. 1001, 22:11–16. Petitioner challenges each of these claims as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 65–66.

For these limitations, Petitioner observes that Wise teaches connecting its architecture through "the Internet," as well as wide-area and local-area

networks, and that Burrows discloses that "other wide or local area networks" may be "used for locating and indexing information." *Id.* at 65 (citing Ex. 1006, 40–42; Ex. 1007, 3:51–61). Patent Owner does not dispute Petitioner's analysis outside of its arguments directed at underlying independent claim 9, and we determine that Petitioner makes a sufficient showing for each claim.

We conclude that Petitioner shows, by a preponderance of the evidence, that dependent claims 11–13 are unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows.

11. Dependent Claims 14 and 15

Claim 14 depends from independent claim 9 and recites that "said computer is configured to establish or adjust said rankings associated with said plurality of web sites when instructed by said user to access said plurality of web sites to retrieve said information." Ex. 1001, 22:17–20. Claim 15 depends from independent claim 9 and recites that

> said computer is configured to establish or adjust said rankings associated with said plurality of web sites without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site.

Id. at 22:21–28. The limitations of these claims generally parallel those recited in corresponding method claims 5 and 7, and Petitioner relies on the same analysis in challenging claims 14 and 15 as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 66. Patent Owner

does not dispute Petitioner's analysis for these claims, and Petitioner's showing is sufficient for the reasons we discuss above.

We accordingly conclude that Petitioner shows, by a preponderance of the evidence, that claims 14 and 15 are unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows.

E. Challenges Based on Kovatch and Neal

Petitioner challenges claims 1–5, 9, 10, 13, and 14 as unpatentable under 35 U.S.C. § 103(a) over Kovatch and Neal; and challenges claims 6–8, 11, 12, and 15 as unpatentable under 35 U.S.C. § 103(a) over Kovatch, Neal, and Burrows. Pet. 5–40. As we discuss above, Petitioner shows, by a preponderance of the evidence, that each of these challenged claims is unpatentable for obviousness over a combination of Wise and Shaffer, alone or in combination with Burrows. We accordingly need not reach the issues raised by Petitioner's additional challenges for obviousness over a combination of Kovatch and Neal, alone or in combination with Burrows, and we decline to do so. *See* Tr. 6:17–20 (Petitioner stating at oral hearing that "if Your Honors were to agree that the Wise grounds invalidate the claims, then the Kovatch grounds and the inventorship do not need to be decided").

III. CONCLUSION[6]

The table below summarizes our conclusions as to the challenged claims.

[6] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this

Claims	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 9, 10, 13, 14	103(a)	Kovatch, Neal[7]		
6–8, 11, 12, 15	103(a)	Kovatch, Neal, Burrows[7]		
1, 2	103(a)	Wise, Shaffer	1, 2	
3–15	103(a)	Wise, Shaffer, Burrows	3–15	
Overall Outcome			1–15	

IV. ORDER

In consideration of the foregoing, it is

ORDERED that claims 1–15 of U.S. Patent No. 7,881,941 B2 have been shown, by a preponderance of the evidence, to be unpatentable; and

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of our decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

Decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

[7] We decline to reach Petitioner's allegations based on Kovatch and Neal, or Kovatch, Neal, and Burrows, for the reasons given above.

IPR2022-00358
Patent 7,881,941 B2

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Paper 32
Entered: August 1, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

PARUS HOLDINGS, INC.,
Patent Owner.

IPR2022-00523
Patent 8,185,402 B2

Before THU A. DANG, PATRICK M. BOUCHER, and STACEY G. WHITE, *Administrative Patent Judges*.

DANG, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background

In response to a Petition (Paper 2, "Pet.") filed by Google LLC ("Petitioner"), we instituted *inter partes* review of claims 1–15 ("the challenged claims") of U.S. Patent No. 8,185,402 B2 (Ex. 1001, "the '402 patent"). *See* Paper 7 ("Dec. Inst."). During trial, Parus Holdings, Inc. ("Patent Owner") filed a Response (Paper 12, "PO Resp."), to which Petitioner filed a Reply (Paper 18, Pet. Reply"). In turn, Patent Owner filed a Sur-reply. Paper 21 ("PO Sur-reply"). An oral hearing was held with the parties on May 4, 2023. A transcript of the hearing has been entered into the record. Paper 31 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, Petitioner has shown by a preponderance of the evidence that claims 1–15 of the '402 are unpatentable.

B. Related Proceedings

The parties identify the '402 patent as the subject of the following related district court matters: (i) *Parus Holdings, Inc. v. Samsung Electronics America, Inc.*, No. 6:21-cv-01073 (W.D. Tex.); (ii) *Parus Holdings, Inc. v. Apple Inc.*, No. 6:21-cv-00968 (W.D. Tex.); (iii) *Parus Holdings, Inc. v. Microsoft Corp.*, No. 6:21-cv-00570 (W.D. Tex.); and (iv) *Parus Holdings, Inc. v. Google, LLC f/k/a Google Inc.*, No. 6:21-cv-00571 (W.D. Tex.) ("the related district court litigation"). Pet. 13; Paper 5, 2.

The '402 patent also is challenged by a different petitioner in IPR2022-00804. *Microsoft Corp. v. Parus Holdings, Inc.*, IPR2022-00804, Paper 1. In addition, Petitioner identifies the following *inter partes* reviews as involving patents related to the '402 patent: IPR2020-00686, IPR2020-00687, IPR2020-00846, IPR2020-00847, IPR2022-00137, IPR2022-00279, IPR2022-00355, and IPR2022-00358. Pet. 14–15.

C. The '402 Patent

The '402 patent, titled "Robust Voice Browser System and Voice Activated Device Controller," issued on May 22, 2012, from Application No. 12/973,475 filed on December 20, 2010, which is a continuation of Application No. 12/030,556 filed on February 13, 2008, which is a continuation of Application No. 11/409,703 filed on April 24, 2006, which is a continuation of Application No. 10/821,690 filed on April 9, 2004, which is a continuation of Application No. 09/776,996 filed on February 5, 2001, which in turn claims priority to the filing date of provisional Application No. 60/180,344 filed on February 4, 2000. Ex. 1001, codes (54), (45), (21), (22), (63), (60).

The '402 patent relates to a system for acquiring information from sources on a network, such as the Internet, comprising a voice browsing system that maintains a database containing a list of information sources, such as websites, wherein each of the information sources is assigned a rank number listed in the database. *Id.* at code (57). In response to a speech command received from a user, a network interface system accesses the information source with the highest rank number in order to retrieve information requested by the user. *Id.* Figure 1 of the '402 patent is reproduced below.

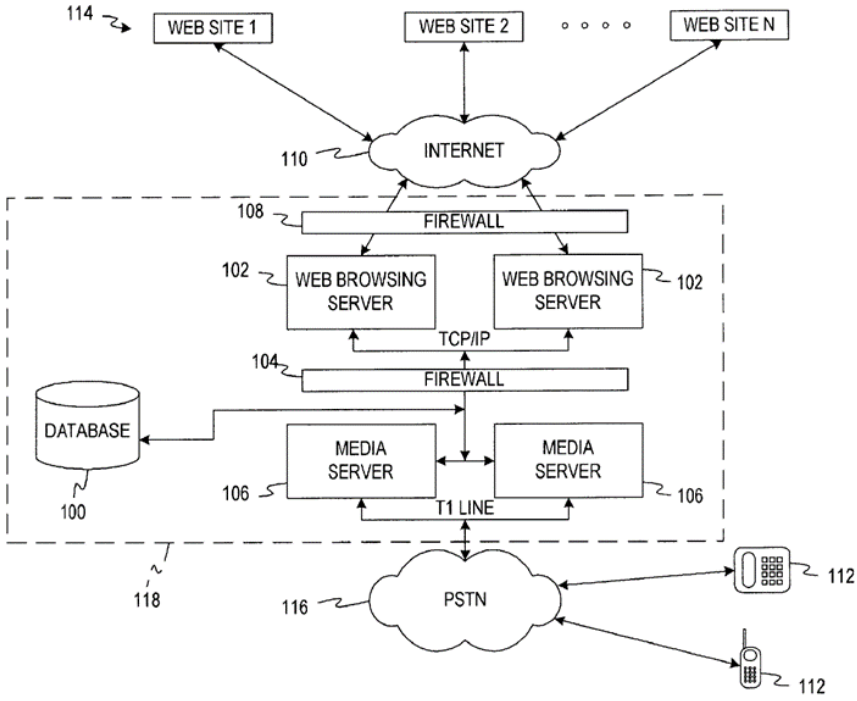

FIG. 1

Figure 1 depicts a "voice browsing system." *Id.* at 4:16–17. As shown in Figure 1, the system includes database 100 connected to web browsing servers 102 and media servers 106. *Id.* at 4:64–67. Web browsing servers 102 provide access to a network like Internet 110, via which websites 114 may be accessed. *Id.* at 6:63–7:2.

A user establishes a connection between the user's voice enabled device 112 and media server 106 using public switched telephone network ("PSTN") 116 by calling a telephone number associated with voice browsing system 118. *Id.* at 19:1–6. Once the connection is established, media server 106 initiates an interactive voice response application that presents the user with a list of options based on the available web-site categories, from which the user makes selections by speaking into voice enabled device 112. *Id.* at 19:6–14. Using a speech recognition engine, the user's voice commands are converted into data messages that are sent to a network interface system, such as a web browsing server, that then accesses

the appropriate information source, such as a website, to gather information requested by the user. *Id.* at 4:49–58.

The voice browser system maintains database 100 containing a list of information sources, such as websites, wherein each information source is assigned a rank number listed in the database along with the record for the information source. *Id.* at 4:64–5:3. Referring to Figure 1, database 100 contains a separate set of records for each website accessible by the system. *Id.* at 5:3–4. Figure 2, reproduced below, illustrates an example of website record 200 in database 100. *Id.* at 4:18–19, 5:4–5.

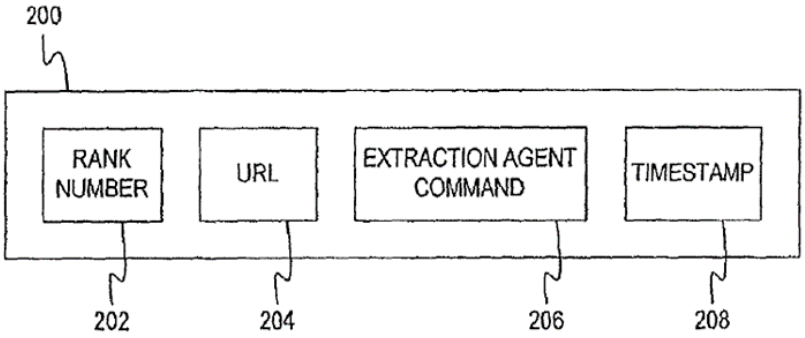

FIG. 2

Figure 2 illustrates an example of a website record in database 100. *Id.* at 4:18–19, 5:4–5. As shown in Figure 2, each website record 200 contains rank number 202 of the website, associated Uniform Resource Locator (URL) 204 for the website, and command 206 that enables an extraction agent to generate proper requests to the website and to format data received from the website. *Id.* at 5:5–10.

Database 100 categorizes each website record 200 according to the "type" of information provided by each website, wherein these categories may be further divided into subcategories. *Id.* at 5:14–29. For each category searchable by a user, database 100 may list several websites, each

with different rank number 202. *Id.* at 19:58–60. As an example, three different websites may be listed as searchable under the category of "restaurants," and each of those websites will be assigned a rank number such as 1, 2, or 3. *Id.* at 19:60–63. The website with the highest rank (i.e., rank=1) will be the first website accessed by web browsing server 102. *Id.* at 20:63–65. If the information requested by the user cannot be found at this first website, web browsing server 102 will then search the second ranked website and so forth down the line, until the requested information is retrieved or no more websites are left to be checked. *Id.* at 19:65–20:2.

In a preferred embodiment, website polling and ranking methodology allows the system to detect changes in websites and adapt to those changes in real-time. *Id.* at 3:58–61. Referring to Figure 1, a polling mechanism continually polls or "pings" each of the sites listed in database 100. *Id.* at 20:15–18. Web browsing server 102 sends brief data requests to each site listed in database 100 and monitors the response to determine whether it is complete and in the expected format. *Id.* at 20:19–25. Polled websites that provide a complete response in the expected format have their ranking established based on their "response time" so that websites with faster response times are ranked higher than those with slower response times. *Id.* at 20:25–28. If web browsing server 102 receives no response from the polled website or if the response received is not in the expected format, then the rank of that website is lowered. *Id.* at 20:30–33.

Since web browsing server 102 accesses websites based upon their ranking number, only those websites that produce useful and error-free responses will be used by the voice browser system to gather information requested by the user. *Id.* at 20:38–41.

D. Challenged Claims

Of the challenged claims (1–15), claims 1 and 9 are the independent claims. Claims 2–8 depend from claim 1, and claims 10–15 depend from claim 9. Independent claim 1 is illustrative and is reproduced below:

> 1. A method for retrieving information from web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:
>
> providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;
>
> providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;
>
> providing a speech command to said speaker-independent speech recognition engine,
>
> said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved, said computer first accessing a first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;
>
> said speech synthesis engine producing an audio message containing any retrieved information from said web sites; and
>
> said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

Ex. 1001, 23:7–34.

E. Evidence

Petitioner relies on the references listed below.

Reference		Date	Exhibit No.
Kovatch	WO 01/50453 A2	Pub. July 12, 2001	1004
Neal	US 6,324,534 B1	Nov. 27, 2001	1010
Burrows	US 5,765,149	June 9, 1998	1006
Wise	US 5,884,262	March 16, 1999	1007
Shaffer	US 5,950,165	Sep. 7, 1999	1011
Kovatch Provisional	60/174,371	Filed Jan. 4, 2000	1005

In addition, Petitioner relies on Declarations by Stuart J. Lipoff, P.E. Exs. 1002, 1050. Mr. Lipoff was cross-examined by Patent Owner, and a transcript of his deposition was entered into the record. Ex. 2061.

Patent Owner relies on a Declaration by Randy Winters. Ex. 2063. Mr. Winters was cross-examined by Petitioner, and a transcript of his deposition was entered into the record. Ex. 1052.[1]

F. Instituted Grounds of Unpatentability

We instituted *inter partes* review of all challenged claims on all challenges in the Petition. Petitioner contends that claims 1–15 of the '402 patent are unpatentable based on the following grounds. Pet. 2.

[1] The parties also filed evidence related to Patent Owner's arguments for antedating Kovatch: 1) Declarations by Hal Poel and Alex Kurganov, filed by Patent Owner, Exs. 2043, 2052; 2) cross-examination testimony of Messrs. Poel and Kurganov, filed by Petitioner, Exs. 1051, 1053; 3) Declaration by Martin G. Walker, Ph.D., filed by Petitioner, Ex. 1048; and 4) cross-examination testimony of Dr. Walker, filed by Patent Owner, Ex. 2065. Because we do not reach Patent Owner's antedating arguments, as further explained below, we do not consider this additional testimonial evidence in detail.

Claim(s) Challenged	35 U.S.C. §[2]	Reference(s)/Basis
1–5, 9, 10, 13, 14	103(a)	Kovatch, Neal
6–8, 11, 12, 15	103(a)	Kovatch, Neal, Burrows
1, 2	103(a)	Wise, Shaffer
3–15	103(a)	Wise, Shaffer, Burrows

II. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In our analysis, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quotation marks omitted). Furthermore, the prior art itself can reflect the appropriate level of ordinary skill in the art. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Petitioner, relying on the testimony of Mr. Lipoff, contends that a POSITA "would have had a Bachelor's Degree in electrical engineering, computer science or a related field, and at least two years of experience with voice interfaces and information processing," wherein "[m]ore education could substitute for less experience, and vice versa." Pet. 4–5 (citing Ex. 1002 ¶¶ 40, 61–74). Patent Owner does not contest Petitioner's proposal or offer an alternative. *See generally* PO Resp.

[2] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the '402 patent was filed before March 16, 2013, the effective date of the relevant amendment, the pre-AIA version of § 103 applies.

We apply Petitioner's definition of a POSITA at the time of the claimed invention because, based on the record, this proposal is consistent with the '402 patent, the asserted prior art, and is supported by the testimony of Mr. Lipoff.

B. Claim Construction

We construe each claim "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." 37 C.F.R. § 42.100(b) (2020). Under this standard, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the art (POSITA) at the time of the invention and in the context of the entire patent disclosure. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc).

Neither Petitioner nor Patent Owner proposes any claim construction. *See* Pet. 5; *See generally* PO Resp.

We do not perceive a need to construe any claim terms of the '402 patent to resolve the disputed issues before us. *See, e.g.*, *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that "only those terms need to be construed that are in controversy, and only to the extent necessary to resolve the controversy"))); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs*. in the context of an *inter partes* review).

C. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, "would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness.[3] *See Graham*, 383 U.S. at 17–18.

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")).

D. Claims 1 and 2 as obvious over Wise and Shaffer (ground 3); and Claims 3–15 as obvious over Wise, Shaffer and Burrows (ground 4)

Petitioner contends that Wise and Schaffer render obvious claims 1 and 2 of the '402 patent. Pet. 36–49 (ground 3); *see also* Pet. Reply 1–7. Petitioner further contends that Wise and Shaffer in further view of Burrows render obvious claims 3–15 of the '402 patent. Pet. 49–60 (ground 4); *see*

[3] Neither party presents arguments or evidence of secondary considerations. Therefore, secondary considerations do not constitute part of our analysis herein.

also Pet. Reply 7–8. In response, Patent Owner contends that Wise does not teach or render obvious limitations of claims 1, 2, and 9; the combination of Wise and Shaffer does not teach or render obvious limitations in claims 1 and 9; and the combination of Wise, Shaffer and Burrows does not teach or render obvious limitations of claims 5–9, 14, and 15. PO Resp. 67–79; *see also* PO Sur-reply 1–9. We summarize the asserted prior art below.

1. Wise (Ex. 1007)

Wise relates to accessing information from a computer network via a telephone or other audio devices. Ex. 1007, 1:6–9. Figure 2 of Wise is reproduced below.

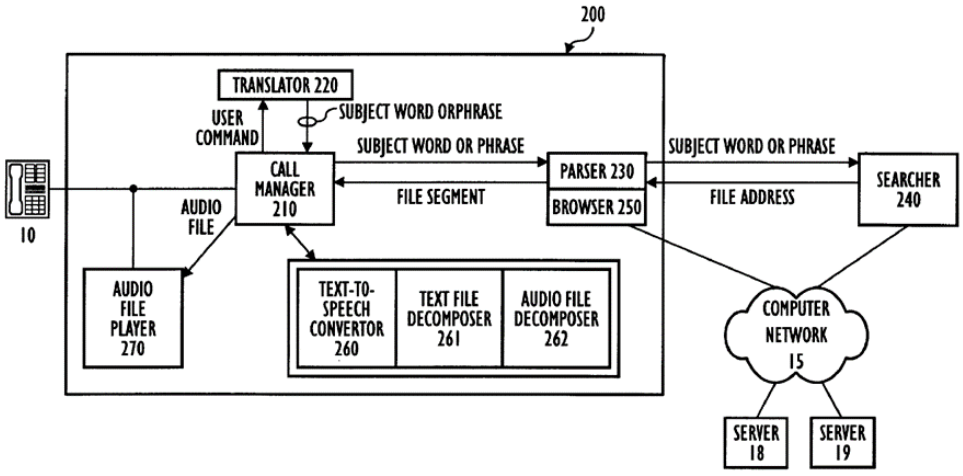

FIG. 2

Figure 2 illustrates a software and hardware architecture in which telephone 10 is connected via a telephone line to system 200, which is then connected through computer network 15 to servers 18, 19. *Id.* at 3:51–58, 5:38–45. Network 15 may be the Internet, and servers 18, 19 may be web servers. *Id.* at 3:55–58. User voice commands or signals from telephone 10 are captured by call manager 210 and sent to a speech-to-text engine embodied by translator 220 for translation. *Id.* at 6:14–30. "Generally, the system will

attempt to interpret the user command and then attempt to navigate based on the command." *Id.* at 6:31–33.

A subject word or phrase derived from the user command is passed to call manager 210, which routes the information to parser 230, which then sends the subject word or phrase to searcher 240 to find addresses of files on target computer network 15 relating to the subject word or phrase. *Id.* at 6:33–46. Once an address is found, parser 230 passes the address to browser 250, which establishes a connection to appropriate server 18 through network 15 so that browser 250 may download a requested file to return to parser 230. *Id.* at 7:7–13. Parser 230 dynamically analyzes the structure and content of the downloaded file, and passes the structure type and associated text or audio content to call manager 210, which routes it for creation of an audio file to be played by audio file player 270. *Id.* at 7:13–37.

Wise describes how "a network search engine may be provided to investigate documents located on a relatively unconstrained network such as the World Wide Web in order to locate documents which are highly compatible with audio presentation of even documents which are specifically labeled to be compatible." *Id.* at 9:56–61. To do so, the search engine may be a "worm type searcher or other robotic search engine," allowing the document search to be automated "along with the process of indexing such documents." *Id.* at 9:61–66. Parser 230 and call manager 210 may interrogate found documents to determine whether they reach a threshold level of audio compatibility. *Id.* at 10:2–6. Compatible documents may be indexed, with the index "stored as one or more documents preferably in a hierarchical order." *Id.* at 10:7–9. "The user may use the navigation commands to traverse the index and invoke a link to a source document." *Id.* at 10:9–10.

2. Shaffer (Ex. 1011)

Shaffer, titled "Automated Visiting of Multiple Web Sites," discloses an apparatus and method for allowing a telephone user to be automatically connected, in sequence, to multiple telephone numbers in response to a single directory assistance query, wherein the user connected to the internet navigates by voice interaction through queued site-visit options. Ex. 1011, codes (54), (57).

Shaffer relates to directory assistance inquiries handled by transferring the caller to a voice response unit that plays the phone number audibly, wherein, in an example, when a shopper wants to call several retail establishments in order to compare services, a user may ask for several numbers in the same inquiry. *Id.* at 1:14–20. Alternatively, the information provided by the directory assistance server can be made in response to inquiries according to categories, or the lists provided could be pared geographically. *Id.* at 5:7–15. In an example, the user inquires about websites, and a browser supplies a list of websites, e.g., in response to a voice search request or saved from a previous session. *Id.* at 5:34–37. In response to the user input, the browser uses the supplied websites to initialize a candidate list of websites to visit. *Id.* at 5:46–48.

Figure 7 of Shaffer is reproduced below:

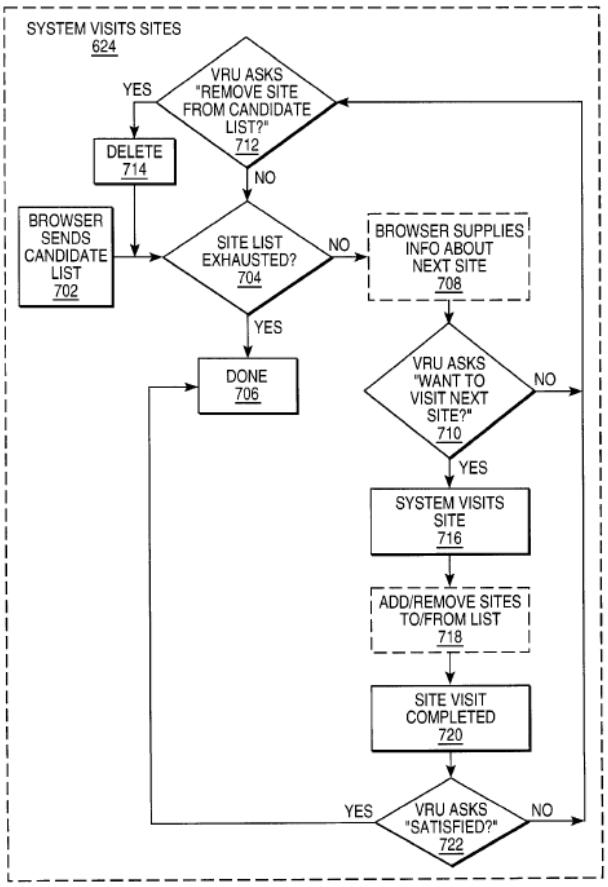

FIG. 7

Figure 7 shows substeps in a method of using "voice response unit" (VRU) navigation on the internet. *Id.* at 2:6–11. As shown in Figure 7, at substep 704, the system determines whether it is at the end of a list of websites to visit, wherein if it determines that it is not at the end of the list, the system at step 710 asks the user if he/she wants to visit the next website, and if so, at substep 716, the system visits the website and the visit is then completed at substep 720. *Id.* at 6:3–24.

3. Burrows (Ex. 1006)

Burrows, titled "Modified Collection Frequency Ranking Method," relates to "ranking records of a database which have been located by searching an index to the database, and more particularly to ranking the records for presentation based on the content of the records." Ex. 1006,

code (54), 1:5–8. In particular, Burrows describes applications in which the database records are Internet web pages and in which a search engine identifies pages of interest. *Id.* at 3:29–44, 3:56–61. Because of the large number of web pages that can be qualified by search queries, Burrows expresses a "desire[] to present search results in a usable manner so that users are not burdened with perusing all qualifying records." *Id.* at 1:47–49.

Figure 2 of Burrows is reproduced below.

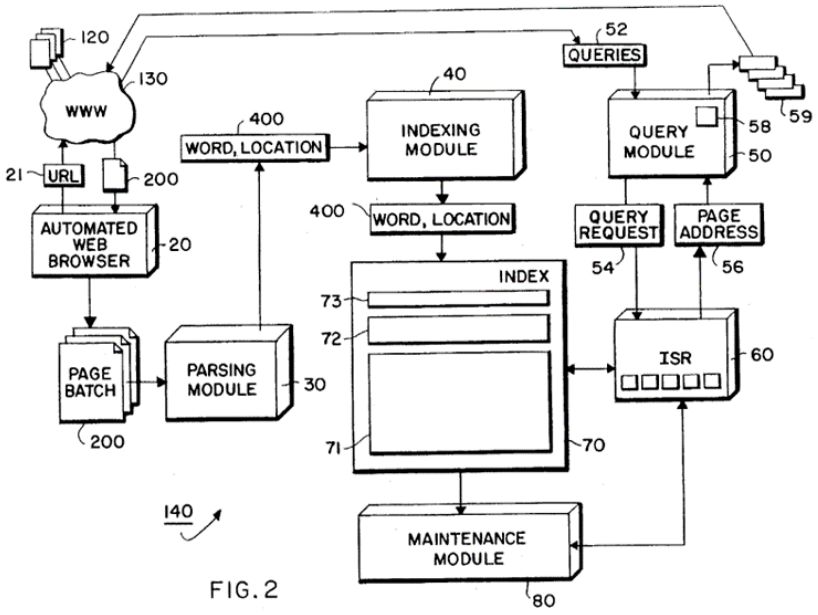

FIG. 2

Figure 2 is a block diagram of a search engine, including an index. *Id.* at 2:27–28. Search engine 140 includes automated web browser 20, parsing module 30, indexing module 40, query module 50, index stream readers 60, index 70, and maintenance module 80. Id. at 4:9–13. Automated web browser 20 periodically sends out requests 21 over network 130 so that sites 120 return records or pages 200. *Id.* at 4:16–20. Parsing module 30 breaks down portions of information of pages 200 into fundamental indexable elements or atomic pairs 400. *Id.* at 4:31–33. Indexing module 40 sorts pairs 400 to generate index 70. *Id.* at 4:46–48.

Query module 50 analyzes queries 52 provided by users to generate query requests 54, which invoke index stream readers 60 to sequentially scan data structures 71–73 within index 70. *Id.* at 5:15–16, 5:25–31. Addresses 56 of pages qualified by the queries are thereby identified so that information 59 about the qualifying pages may be delivered to users by presentation module 58. *Id.* at 5:32–35.

Ranking is performed by assigning weight w to each indexed word, with score W for a page being equal to the sum of the weights w for each occurrence of a word specified in the query (or for each word that does not appear if an exclusionary query was used). *Id.* at 27:35–39. Figure 22 of Burrows is reproduced below.

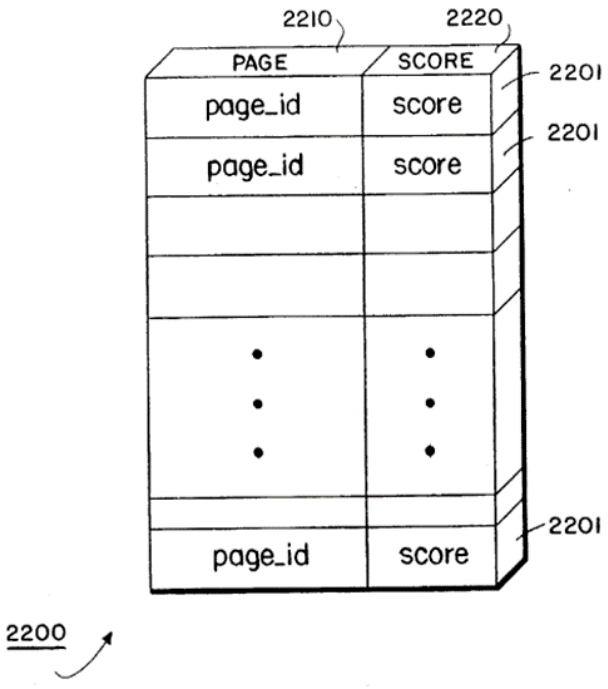

Figure 22 is a block diagram that illustrates a ranking list of qualified pages, with each entry 2201 including identification 2210 of a qualified page and score 2220 associated with that qualified page. *Id.* at 2:66, 28:19–24. Entries 2201 are maintained in rank order according to scores 2220. *Id.*

4. Independent claim 1 as obvious over Wise and Shaffer.

As an initial matter, we address in detail Petitioner's arguments and Patent Owner's responses regarding Wise and Shaffer with respect to the limitations of claim 1.

> *a) "A method for retrieving information from web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device"*

Petitioner presents evidence that Wise describes a "voice response system" including "voice recognition" that "attempt[s] to match a speech input" (e.g., command) via a simple telephone (voice-enabled device) "to a preselected list of potential selections or choices." Pet. 41 (citing Ex. 1007, 1:66–2:2, 2:50–58) (alteration in original). Petitioner contends Wise discloses that after a speech command uttered into the telephone is converted to text, the word or phrase is used to select "predetermined audio-compatible [website] address[es]" or "to find addresses of files on a target computer network 15" relating to the word or phrase (e.g., websites relating to "Washington D.C. weather"). *Id.* at 41–42 (citing Ex. 1007, 6:31–49) (alteration in original). According to Petitioner, Wise "establishes a connection to the appropriate server 18 through []network 15," "downloads the entire requested file," analyzes it, translates it into an audio file, and routes it to the user's audio file player 270. *Id.* at 42 (citing Ex. 1007, 7:7–20, 38–42; Ex. 1002 ¶¶ 207–208) (alteration in original).

Although Patent Owner does not present arguments addressing the specific merits of Petitioner's contentions with respect to the preambles (*see generally* PO Resp.; PO Sur-Reply), the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). Having reviewed all

of Petitioner's assertions regarding the recitations in the preambles, as well as all supporting evidence, we determine on this complete record presented that Petitioner has persuasively shown that the combination of Wise and Shaffer teaches "[a] method for retrieving information from web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of," as recited in claim 1.[4]

> *b) "providing a computer operatively connected to the internet," "providing a voice enabled device operatively connected to said computer," said voice enabled device configured to "receive speech commands from user", said computer "accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved,"*

Petitioner presents evidence that Wise discloses a standard telephone connected to architecture 100, which "is then connected through a computer network 15, such as the internet, to various . . . Web servers." Pet. 42 (citing Ex. 1007, 3:52–61) (alteration in original). Citing to Mr. Lipoff's supporting testimony, Petitioner contends that a POSITA would have understood Wise's architecture 100 may be a computer because it is connected to a computer network and contains "an operating system." *Id.* (citing Ex. 1007, 3:62–66; Ex. 1002 ¶ 209).

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[4] The issue of whether the preamble is limiting need not be resolved because, regardless of whether the preamble is limiting, Petitioner has sufficiently shown that the recitations of a "method" for "retrieving information from web sites by uttering speech commands into a voice enabled device" and for "providing to users retrieved information in an audio form via said voice enabled device" in the preamble of claim 1 are satisfied by Wise in view of Shaffer. *See Realtime Data, LLC v. Iancu*, 912 F.3d at 1375.

Petitioner further presents evidence that Wise discloses that "a standard telephone (voice-enabled device) may be connected to architecture 100, which 'is then connected through a computer network 15, such as the internet, to . . . Web servers.'" Pet. 45 (citing Ex. 1007, 3:52–61; Ex. 1002 ¶ 214; Ex. 1025, 415) (alteration in original). Citing to Mr. Lipoff's supporting testimony, Petitioner explains that, in Wise, "users' speech commands, e.g., 'Baltimore Orioles,' are captured by Call Manager 210 and sent to translator 220 which uses speech recognition to interpret the command as a request for 'the most recent Baltimore Orioles baseball score.'" *Id.* (citing Ex. 1007, 6:14–28; Ex. 1002 ¶ 215). In particular, according to Petitioner, when a user states a speech command, it is provided to Wise's speaker-independent speech recognition engine 360, which "'convert[s]' the 'command to text,' to 'be used by the system to control navigation.'" *Id.* (citing Ex. 1007, 2:53–58, 4:13–16, 6:20–30; Ex. 1002 ¶ 216) (alteration in original). That is, in Wise, after a speech command uttered into the telephone is converted to text, the word or phrase is then used to select "predetermined audio-compatible [website] address[es]" or "to find addresses of files on a target computer network 15" relating to the word or phrase. *See id.* at 41–42 (alteration in original); *see also* Ex. 1007, 6:31–49.

Patent Owner acknowledges that Wise "provides for a speech command (the 'subject word or phrase') that is associated with one or more web site addresses (the audio-compatible address(es))." PO Resp. 68. However, Patent Owner contends that "this 'subject word or phrase' speech command provides no information about any 'information to be retrieved' within a selected website," and thus, "the Wise 'subject word or phrase' **is not associated** with a content descriptor as the limitations require." *Id.*

(citing Ex. 2063 ¶ 282). According to Patent Owner, Wise's subject word or phrase "merely functions to indicate a particular website address so that the particular web page can be downloaded and processed." *Id.* (citing Ex. 2063 ¶ 282).

We disagree with Patent Owner's arguments. First, as Petitioner points out, "there is nothing in Claim[] 1 . . . that requires 'a speech command further associated with a content descriptor'" as Patent Owner contends (PO Resp. 68), since such limitation "is found only in dependent Claim 2." Pet. Reply 2. In fact, claim 1 does not even recite a "content descriptor." *See* Ex. 1001, 23:7–34.

We are persuaded by Petitioner's reliance on Wise's use of a word or phrase to select predetermined audio-compatible website addresses or to find addresses of files on a target computer network "relating to" or "associated with" the word or phrase, as specifically required by claim 1. *See* Pet. 41–42; *see also* Ex. 1007, 6:31–49. Here, Patent Owner acknowledges that Wise's subject word or phrase "functions to indicate a particular website address so that the particular web page can be downloaded and processed." PO Resp. 68 (citing Ex. 2063 ¶ 282). We credit Mr. Lipoff's testimony, which is consistent with Wise's teachings, that a "subject word or phrase" speech command, such as "Baltimore Orioles score," in Wise, functions to indicate a website address with scores for the Baltimore Orioles to be downloaded and processed, and thus, "is information about the 'information to be retrieved.'" *See* Ex. 1050 ¶¶ 11–13.

Having reviewed all of Petitioner's assertions regarding these limitations, as well as all supporting evidence, we determine on the complete record presented that Petitioner has persuasively shown that the combination of Wise and Shaffer teaches "providing a computer operatively connected to

the internet," "said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine," "providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users", "said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved," as recited in claim 1.

> *c) "said computer first accessing a first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed"*

Petitioner provides evidence that Wise discloses using navigation commands to traverse the index and invoke a link to a source document. Pet. 38 (citing Ex. 1007, 10:2–4, 10:7–10; Ex. 1002 ¶¶ 97–101). According to Petitioner, Wise's system accesses websites to retrieve user-requested information, but Wise "does not disclose sequentially/subsequently accessing websites until information is found." *Id.* Relying on the supporting testimony of Mr. Lipoff, Petitioner contends that a POSITA would have been motivated to modify Wise's system that accesses websites to retrieve user-requested information based on Shaffer, resulting in a system that accesses websites sequentially/subsequently until information is found. *Id.* (citing Ex. 1002 ¶ 200). In particular, Petitioner contends that a POSITA would have been motivated "to apply Shaffer's sequential search technique when retrieving information from websites in Wise's ranked index" to "maximize the likelihood of finding the desired information and efficiently use computing resources by searching in the most likely sources first." *Id.* at

40–41 (citing Ex. 1002 ¶ 205). Petitioner notes that "[t]he language of independent claim 1 does not preclude user interaction or instruction during the process of the sequential search." *Id.* at 46 (citing Ex. 1002 ¶ 218).

Patent Owner acknowledges Petitioner's contention that "independent claim 1 does not preclude user interaction or instruction during the process of sequential search," but argues that Petitioner and Mr. Lipoff "fail to provide any evidence, outside of mere speculation, that user interaction can be a part of the sequential search process recited in the claims of the '402 patent." PO Resp. 72 (citing Pet. 46; Ex. 1002 ¶ 218). According to Patent Owner, since the '402 patent is silent as to the participation of a user in the sequential search process, "to suggest otherwise is an impermissible broadening of the patent specification, and that flies in the face of the fundamental principles of claim interpretation." *Id.* at 73 (citing Ex. 2063 ¶ 290). Rather, Patent Owner contends that the '402 patent's specification "teaches **against** the notion of user interaction in the claimed 'sequentially accessing' operation," which "is time consuming and inefficient," since such "multiple user interactions, website retrievals, and web page processing operations run counter to the goals of the '402 specification." *Id.* at 73–75 (citing Ex. 2063 ¶¶ 291–292; Ex. 1001, 2:40–44, 2:55–58, 3:63–4:8). According to Patent Owner, such combination "is nothing more than a justification for the hindsight reconstruction of Claim 1 using Wise and Shaffer." *Id.* at 75.

We are not persuaded by Patent Owner's arguments. In particular, we disagree with Patent Owner's position that the claim language in view of the '402 specification precludes user interaction or instructions during the process of the sequential search, wherein Petitioner must "provide any

evidence, outside of mere speculation, that user interaction can be a part of the sequential search process recited in the claims of the '402 patent." PO Resp. 72–75. Instead, we agree with Petitioner that Patent Owner's suggested "without user interaction" is an unclaimed negative limitation unsupported by the plain and ordinary meaning of the claim language and the specification. *See* Pet. Reply 4–6.

"While a negative limitation need not be recited in the specification *in haec verba*, there generally must be something in the specification that conveys to a skilled artisan that the inventor intended the exclusion." *Novartis Pharm. Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1017 (Fed. Cir. 2022). Here, Patent Owner does not provide sufficient evidentiary support that conveys an intended exclusion of user interaction during sequential access. Instead, both parties and both experts merely point out that the specification of the '402 patent is silent with respect to user participation during sequential access. PO Resp. 73 (Patent Owner asserting that "the '402 patent is silent as to the participation of a user in the sequential search process"); Ex. 2063 ¶ 289 (Mr. Winters testifying that "there is no disclosure in the specification of the '402 patent related to user interaction in the sequential search process"); Pet. Reply 5 (Petitioner asserting that Patent Owner is "[i]mporting a requirement that user interaction is precluded by the claims—a negative limitation, when the specification is wholly silent on it"); Ex. 2061, 107:15–22 (Mr. Lipoff agreeing that "there's no specific mention of the user interacting" in the portion of the specification related to "the sequential search"). As the Federal Circuit explained in *Novartis*, silence is not sufficient support for a negative limitation. *See Novartis*, 38 F.4th at 1017.

Based on these facts, we find insufficient reason to exclude user interaction from the plain and ordinary meaning of the sequential access limitation. Instead, we are persuaded by Petitioner's reliance on Shaffer for disclosing the sequential access limitation as recited. *See* Ex. 1011, 6:3–29.

In particular, Shaffer discloses determining whether a system is at the end of a list of sites to visit, and sequentially visiting the sites until the user is satisfied. Ex. 1011, 6:3–29. Furthermore, Wise's system accesses web pages relating to a subject phrase to retrieve user-requested information. Ex. 1007, 6:31–49. We credit the supporting testimony of Mr. Lipoff, which is consistent with the teachings of Wise and Shaffer, in which he testified that a POSITA would have been motivated to modify Wise's system that accesses websites to retrieve user-requested information based on Shaffer, resulting in a system that accesses websites sequentially/subsequently until information is found. *See* Ex. 1002 ¶ 200.

We disagree with Patent Owner that the '402 patent's specification "teaches against the notion of user interaction in the claimed 'sequentially accessing' operation," which "is time consuming and inefficient." PO Resp. 73–75. A given course of action often has simultaneous advantages and disadvantages, which "does not necessarily obviate motivation to combine." *Allied Erecting v. Genesis Attachments*, 825 F.3d 1373, 1381 (Fed. Cir. 2016). Here, Petitioner has articulated sufficient reason, supported by rational underpinning, to effect the combination of teachings it proposes. We credit Petitioner's contention, which is supported by Mr. Lipoff's testimony, that a POSITA would have been motivated "to apply Shaffer's sequential search technique when retrieving information from websites in Wise's ranked index" in order to "maximize the likelihood of finding the desired information and efficiently use computing resources by searching in

the most likely sources first." Pet. 40–41; Ex. 1002 ¶ 205. We accordingly determine that Petitioner makes a sufficient showing for the sequential access limitation.

We determine on the complete record presented that Petitioner has persuasively shown that the combination of Wise and Shaffer teaches a computer "first accessing a first web site" of a plurality of web sites and, "if said information to be retrieved is not found at said first web site, . . . sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed," as recited in claim 1.

> *d) "said speech synthesis engine producing an audio message containing any retrieved information from said web sites," and "transmitting said audio message to said users via said voice enabled device"*

Petitioner presents evidence that Wise's system "[t]ypically… use[s] a text-to-speech engine to convert the document [i.e., webpage] to audio information," the document being accessed and passed "through a parser to interpret its contents" and "a text-to-speech engine to read the text," wherein the parser "passes the structure type and the associated text or audio contents" to a call manager "which routes it to the appropriate board to create an audio file to be played by [an] audio file player." Pet. 47–48 (citing Ex. 1007, 2:11–17, 2:28–34, 5:66–7:5, 7:34–55; Ex. 1002 ¶ 222) (alteration in original). Petitioner further contends that Wise discloses that "a text-to-speech convertor output could" alternatively "be bridged directly to a telephone line." *Id.* at 48 (citing Ex. 1007, 7:34–55; Ex. 1002 ¶ 223).

Although Patent Owner does not present arguments in its Response or Sur-reply addressing the merits of Petitioner's contentions with respect to this claim limitation (*see generally* PO Resp.; PO Sur-reply), the burden

remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378. Having reviewed all of Petitioner's assertions regarding this limitation, as well as all supporting evidence, we determine on the complete record presented that Petitioner has persuasively shown that the combination of Wise and Shaffer teaches "said speech synthesis engine producing an audio message containing any retrieved information from said web sites; and said speech synthesis engine transmitting said audio message to said users via said voice enabled device," as recited in claim 1.

e) Claim 1 conclusion

For the foregoing reasons, Petitioner has proven, by a preponderance of the evidence, that claim 1 would have been obvious over Wise and Shaffer under 35 U.S.C. § 103(a).

5. Dependent claim 2 depending from claim 1 over Wise and Shaffer.

Claim 2 depends from independent claim 1 and recites that "said speech command is further associated with a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved." Ex. 1001, 23:35–39. Petitioner presents evidence that Wise's documents contain content "useful for navigation" "such as 'tags that 'designat[e] links or portions of a document.'" Pet. 48 (citing Ex. 1007, 2:61–66). According to Petitioner, "software residing on the server IP uses Wise's document(s) with tags to execute the functionality of the 'content descriptor' as described by the '402 patent." *Id.* Relying on the supporting testimony of Mr. Lipoff, Petitioner contends that a POSITA would have understood that such software is a "content descriptor" because "it uses 'tags' and the 'file associated with the web page' which directs the extraction agent (Wise's

Parser 230) to identify and interpret data from the website," wherein "this software is stored in script 'files' to be accessed by the content extraction agent (Parser 230)" to execute scripts that parse tag data accessed by Wise's "file-based hierarchical system." *Id.* at 48–49 (citing Ex. 1007, 10:7–19; Ex. 1002 ¶ 224).

Patent Owner acknowledges Petitioner's reliance on Wise's "tags to execute the functionality of the 'content descriptor,'" but argues that Petitioner is "silent as to how Wise provides for 'said speech command is further associated with a content descriptor associated with each said web site address' as the limitation requires." PO Resp. 67–68. Patent Owner contends that Wise's "subject word or phrase" is "**not associated with** a content descriptor as the limitations require." *Id.* at 68 (citing Ex. 2063 ¶ 282). In particular, according to Patent Owner, in Wise, "**after** a user has provided a **subject work or phrase command** relating to a stock quote web page and **after** a corresponding stock quote web page has been downloaded and processed, the user may provide an **additional command**" (e.g., a command for a particular stock symbol), such that the system may skip ahead to that particular stock information within the webpage. *Id.* at 69 (citing Ex. 1007, 3:4–8). Patent Owner contends that "the 'subject word or phrase' command is unrelated and has no association with any additional navigation command," wherein both these types of speech commands are distinct and perform very different functions." *Id.* at 69–70.

We are not persuaded by Patent Owner's arguments, which turn on the contention that Wise's subject word or phrase is "not associated with a content descriptor as the limitations require" because Wise's content descriptor is not known beforehand but rather after a user has provided a subject word or phrase command relating to a web page. PO Resp. 68–70

(emphasis omitted). However, claim 2 merely requires that the speech command be "associated with" the content descriptor. *See* Ex. 1001, 23:35–39. As Petitioner points out, although Patent Owner contends that Wise's content descriptor file ("tag") "must be used to navigate a webpage ***before*** it is 'processed,'" whereas "Wise creates the association ***after*** the webpage is processed" (PO Resp. 68–70), no such distinction from the claimed "content descriptor" is provided in the specification of the '402 patent, and "importantly, no before/after temporal requirement is disclosed." Pet. Reply 3.

Here, we are persuaded by Petitioner's contention, which is supported by Mr. Lipoff's testimony, that a POSITA would have understood that, in Wise, for speech commands to operate, "a user's natural speech recognition grammars are recognized by the system to retrieve information from a plurality of websites," wherein, "logically, a 'subject work or phrase' speech command such as 'Baltimore Orioles score' in Wise is information about the 'information to be retrieved.'" *Id.* at 2–3 (citing Ex. 1050 ¶¶ 11–13). As Petitioner explains, for "stock" quotes for example, Wise discloses "a content descriptor file ('tag') designating stock symbol links in 'a document containing a list of stock symbols and quotes,'" wherein "in response to a speech command requesting, e.g., 'today's stocks,'" the data including "today's stocks" would have been returned which clearly would be "'associated' with the command." *Id.* at 4 (citing Ex. 1050 ¶¶ 14–17). We agree with Petitioner that "[n]othing more is required by the claims." *Id.*

We are persuaded by Petitioner's reliance on Wise's use of a word or phrase to select predetermined audio-compatible website addresses or to find addresses of files on a target computer network "relating to" or "associated with" the word or phrase. *See* Pet. 41–42; *see also* Ex. 1007, 6:31–49. We

credit Mr. Lipoff's testimony, which is consistent with Wise's teachings, that a "subject word or phrase" speech command such as "Baltimore Orioles score" in Wise "is information about the 'information to be retrieved.'" *See* Ex. 1050 ¶¶ 11–13.

Having reviewed all of Petitioner's assertions regarding claim 2, as well as all supporting evidence, as well as Patent Owner's evidence and arguments to the contrary, we determine on the complete record presented that Petitioner has persuasively shown that that the combination of Wise and Shaffer teaches providing a "speech command" that is "associated with" a "content descriptor," wherein the content descriptor is in turn "associated with each said web site address" and "pre-defining a portion of said web site containing said information to be retrieved," as recited in claim 2. For the foregoing reasons, Petitioner has proven, by a preponderance of the evidence, that claim 2 would have been obvious over Wise and Shaffer under 35 U.S.C. § 103(a).

6. Independent claim 9 as obvious over Wise, Shaffer and Burrows.

Petitioner challenges independent claim 9 as unpatentable under 35 U.S.C. § 103(a) over Wise, Shaffer, and Burrows. Pet. 49–56. With respect to Wise and Shaffer, Petitioner relies on the same analysis discussed above for claim 1. *Id.* at 50–53. Furthermore, Petitioner presents evidence that storing the index in a database would have been an obvious implementation of Wise's system because "databases are a standard format for storing computer files" and a POSITA would have understood that Wise's predetermined addresses are a "plurality of web site addresses" that "are stored and ranked in the system." *Id.* at 51–53 (citing Ex. 1007, 4:17–23, 4:66–5:4, 9:61–65, 10:2–10; Ex. 1002 ¶¶ 233–236). According to

Petitioner, the Wise and Shaffer combination discloses "sequentially accessing a plurality of websites" and thus, "[a]n obvious implementation of the Wise/Shaffer combination would have been to include a ranking indicating the order in which the websites in Wise's ordered index are accessed, as Burrows teaches." *Id.* (citing Ex. 1002 ¶¶ 238–239).

Patent Owner disputes Petitioner's analysis regarding Wise and Shaffer generally for the same reasons discussed above in connection with independent claim 1. *See* PO Resp. 74–81. Furthermore, Patent Owner contends that Petitioner's reliance on "the Wise/Shaffer combination" provides "no content relating to the ranking aspects" of claim 9. *Id.* at 75–76. Patent Owner then contends the combination of Wise and Shaffer in further view of Burrows does not show the claimed ranking and polling with respect to the claimed "information to be retrieved," as recited in claim 9. *Id.* at 76–79.

We are not persuaded by Patent Owner's arguments. In particular, although Patent Owner contends that the Wise/Shaffer combination provides "no content relating to the ranking aspects" (PO Resp. 75–76), we are instead persuaded by Petitioner's reliance on the combination of Wise and Shaffer in further view of Burrows for such ranking aspects. Pet. 53. We find persuasive Petitioner's contention that "[a]n obvious implementation of the Wise/Shaffer combination would have been to include a ranking indicating the order in which the websites in Wise's ordered index are accessed, as Burrows teaches." *Id.*

Although Patent Owner contends the combination of Wise, Shaffer and Burrows does not show the claimed ranking and polling with respect to the claimed "information to be retrieved" (PO Resp. 76–79), Patent Owner does not address Petitioner's particular combination of the references. *See*

Pet. Reply 7. The test for a determination of obviousness "is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981)). As Petitioner points out, Petitioner "has not suggested that a POSITA would have bodily incorporated the teachings of Burrows (such as its search methodology) in the Wise-Shaffer combination." Pet. Reply 7. We credit Petitioner's particular argument, which is not addressed by Patent Owner but is supported by Mr. Lipoff's testimony, that an obvious implementation of the Wise/Shaffer combination would have been to "apply Burrow's *ranking and polling* teachings 'to Wise/Shaffer's *sequentially searched* index,' wherein the search results are navigated sequentially until the information to be retrieved is found. *Id.* (citing Pet. 49–50); *see also* Ex. 1002 ¶¶ 233–234. As Petitioner points out, Patent Owner's contentions "ignore[] Shaffer, which, in this combination, sequentially accesses a plurality of websites until the information to be retrieved is found." Pet. Reply 8 (citing Ex. 1050 ¶¶ 25–27).

Having reviewed all of Petitioner's assertions regarding the limitations of claim 9, as well as all supporting evidence and Patent Owner's evidence and argument to the contrary, we determine on the complete record presented that Petitioner has persuasively shown that the combination of Wise, Shaffer, and Burrows teaches the limitations recited in claim 9. For the foregoing reasons, Petitioner has proven, by a preponderance of the evidence, that claim 9 would have been obvious over Wise, Shaffer and Burrows under 35 U.S.C. § 103(a).

7. Claims 3–8 depending from claim 1, and claims 10–15 depending from claim 9, as obvious over Wise, Shaffer, and Burrows.

Citing Mr. Lipoff's testimony for support, Petitioner presents evidence that the limitations recited in dependent claims 3–8, and 10–15 would have been obvious over Burrows in combination with Wise and Shaffer to a person of ordinary skill in the art. Pet. 49, 56–60 (citing Ex. 1006, 1:38–49, 3:29–33, 3:40–42, 3:56–4:5, 4:16–20, 13:39–45, 15:11–16, 27:22–32, 28:36–50, 32:14–47; Ex. 1007, 3:51–61; Ex. 1002 ¶¶ 225–229, 247–271). In particular, with respect to claim 3 depending from claim 1, Petitioner presents evidence that the combination of Wise and Shaffer discloses "said speech command is further associated with a ranking from highest to lowest associated with each said web site, . . . indicating the order in which the plurality of web sites are accessed." Pet. 56 (citing Ex. 1002 ¶¶ 247–248). With respect to claim 4 depending from claim 1, Petitioner presents evidence that the combination of Wise and Shaffer discloses "said computer accesses said plurality of web sites based on said ranking, . . . accessing said web site having the highest ranking." *Id.* (citing Ex. 1002 ¶¶ 249–250). With respect to claim 5 depending from claim 1, Petitioner presents evidence that the combination of Wise and Shaffer discloses "adjusting said rankings . . . . such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information . . . are assigned lower rankings." *Id.* (citing Ex. 1002 ¶¶ 251–252). Similarly, with respect to claim 14 depending from claim 9. Petitioner presents evidence that the combination of Wise and Shaffer in further view of Burrows discloses "said computer is configured to establish or adjust said rankings." *Id.* at 59 (citing Ex. 1002 ¶¶ 268–269).

With respect to claim 6, which recites "periodically polling each said web site to determine whether said web site contains said information to be retrieved" (Ex. 1001, 23:53–55), Petitioner presents evidence that "Burrows discloses the polling features." Pet. 57. Relying on Mr. Lipoff's supporting testimony, Petitioner further contends that a POSITA would have been motivated to include Burrow's polling mechanism to Wise and Shaffer "to ensure that [the] most up-to-date and complete information is presented to the user." *Id.* (citing Ex. 1006, 3:56–4:5; Ex. 1002 ¶¶ 253–255). Similarly, with respect to claim 7, which recites "the computer periodically polls each said web site without being instructed by said user . . . creating a ranking of said plurality of web sites based on said periodic polling" (Ex. 1001, 23:56–63), Petitioner presents evidence that "Burrows discloses the polling features." Pet. 57. Relying on Mr. Lipoff's supporting testimony, Petitioner further contends that a POSITA would have found it obvious to include Burrow's polling mechanism to Wise and Shaffer "to present 'search results in a usable manner so that users are not burdened with perusing all qualifying records, 'to admit modified . . . entries' as necessary to the index, and because long response times are less desirable than short response times." *Id.* at 57–58 (citing Ex. 1006, 1:47–49, 3:56–4:5, 13:39–45; Ex. 1002 ¶¶ 256–258) (alteration in original). With respect to claim 15 depending from claim 9, Petitioner similarly presents evidence that the combination of Wise, Shaffer and Burrows discloses "said computer is configured to establish or adjust said rankings . . . based on periodic polling of each of said web sites without being instructed." *Id.* at 60 (citing Ex. 1002 ¶¶ 270–271).

With respect to claim 8 depending from claim 1, which recites "periodically searching said internet to find new web sites containing said

information to be retrieved, and adding said new web sites to said plurality of websites" (Ex. 1001, 23:64–66), Petitioner presents evidence that Burrows discloses polling features. Pet. 58. Relying on Mr. Lipoff's supporting testimony, Petitioner contends that a POSITA would have been motivated to combine Burrows with Wise and Shaffer "to ensure that [the] most up-to-date and complete information is presented to the user." *Id.* (citing Ex. 1006, 3:56–4:5; Ex. 1002 ¶¶ 259–261).

With respect to claim 10 depending from claim 9, which recites "said phone comprises a standard telephone, a cellular phone, or an IP phone" (Ex. 1001, 24:45–46), Petitioner presents evidence that Wise discloses a standard telephone which "may be connected to []architecture 100 using a standard POTS or ISDN telephone line." Pet. 58 (citing Ex. 1007, 3:51–61; Ex. 1002 ¶ 262) (alteration in original). With respect to claim 11 depending from claim 9, which recites "said internet is a local area network" (Ex. 1001, 24:47–48), Petitioner presents evidence that Wise's architecture 100 is "connected through a computer network 15, such as the Internet, to various . . . Web servers," and that Burrows teaches that "other wide or local area networks" may be "used for locating and indexing information." Pet. 58–59 (citing Ex. 1007, 3:51–61). Relying on the supporting testimony of Mr. Lipoff, Petitioner contends that "a POSITA would also have been motivated to combine Burrow's LAN or WAN with Wise/Shaffer and had a reasonable expectation of success in doing so." *Id.* at 59 (Ex. 1002 ¶¶ 263–264). With respect to claim 12 depending from claim 9 which similar recites "said internet is a wide area network" (Ex. 1001, 24:49–50), Petitioner presents evidence that Wise and Burrows disclose a wide area network. Pet. 59 (citing Ex. 1002 ¶¶ 265–266). With respect to claim 13 depending from claim 9 which recites "said internet is the Internet" (Ex. 1001, 24:51–52),

Petitioner presents evidence that Wise discloses that architecture 100 is "connected through a computer network 15, such as the Internet." Pet. 59 (citing Ex. 1007, 3:51–61; Ex. 1002 ¶ 267).

Although Patent Owner does not provide arguments for the dependent claims separate from the independent claims (*see generally* PO Resp.; PO Sur-reply), the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378. Having reviewed all of Petitioner's assertions regarding the limitations of these claims, as well as all supporting evidence, we determine on this complete record presented that Petitioner has persuasively shown that claims 3–8, and 10–15 would have been obvious over Wise, Shaffer and Burrows.

For the foregoing reasons, Petitioner has proven, by a preponderance of the evidence, that claims 3–8, and 10–15 would have been obvious over Wise, Shaffer and Burrows under 35 U.S.C. § 103(a).

E. Obviousness of Claims 1–2 over Kovatch and Neal (Ground 1); and Claims 3–15 over Kovatch Neal and Burrows (Ground 2).

Petitioner contends that claims 1–5, 9, 10, 13, and 14 of the '402 patent also would have been obvious over Kovatch and Neal (Ground 1), and claims 6–8, 11, 12, and 15 over Kovatch, Neal and Burrows (Ground 2). *See* Pet. 5–36. Because the Wise-Shaffer/Wise-Shaffer-Burrows obviousness grounds (Grounds 3–4) are dispositive as to all challenged claims (*see supra* § II(D)), we need not reach Petitioner's challenges based on obviousness over Kovatch and Neal, and Kovatch, Neal and Burrows. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding a petitioner "is entitled to a final written decision addressing all of the claims it has challenged"); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x

984, 990 (Fed. Cir. 2020) (non-precedential) (recognizing that "[t]he Board has the discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims"); *see also* Tr. 6:17–20 (Petitioner stating at oral hearing that "if Your Honors were to agree that the Wise grounds invalidate the claims, then the Kovatch grounds and the inventorship do not need to be decided").

III. CONCLUSION[5]

For the foregoing reasons, we determine on the record at hand that Petitioner has demonstrated by a preponderance of the evidence that the challenged claims of the '402 patent are unpatentable.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 9, 10, 13, 14	103(a)	Kovatch, Neal[6]		
6–8, 11, 12, 15	103(a)	Kovatch, Neal, Burrows[7]		

[5] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

[6] We do not reach this ground because we have determined claims 1–5, 9, 10, 13, 14 to be unpatentable under other grounds. *See supra* § II(D).

[7] We do not reach this ground because we have determined claims 6–8, 11, 12, and 15 to be unpatentable under other grounds. *See supra* § II(D).

1, 2	103(a)	Wise, Shaffer	1, 2	
3–15	103(a)	Wise, Shaffer, Burrows	3–15	
Overall Outcome			1–15	

IV. ORDER

For the reasons given, it is

ORDERED that, based on the preponderance of the evidence, claims 1–15 of the '402 patent have been shown to be unpatentable; and

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of our decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2022-00523
Patent 8,185,402 B2

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US007881941B2

(12) **United States Patent**
Kurganov et al.

(10) **Patent No.: US 7,881,941 B2**
(45) **Date of Patent: *Feb. 1, 2011**

(54) **ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER**

(75) Inventors: **Alexander Kurganov**, Buffalo Grove, IL (US); **Valery Zhukoff**, Deerfield, IL (US)

(73) Assignee: **Parus Holdings, Inc.**, Bannockburn, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 147 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/030,556**

(22) Filed: **Feb. 13, 2008**

(65) **Prior Publication Data**

US 2008/0189113 A1 Aug. 7, 2008

Related U.S. Application Data

(63) Continuation of application No. 11/409,703, filed on Apr. 24, 2006, now Pat. No. 7,386,455, which is a continuation of application No. 10/821,690, filed on Apr. 9, 2004, now Pat. No. 7,076,431, which is a continuation of application No. 09/776,996, filed on Feb. 5, 2001, now Pat. No. 6,721,705.

(60) Provisional application No. 60/233,068, filed on Sep. 15, 2000, provisional application No. 60/180,344, filed on Feb. 4, 2000.

(51) **Int. Cl.**
G10L 21/06 (2006.01)

(52) **U.S. Cl.** **704/275**

(58) **Field of Classification Search** 704/275
See application file for complete search history.

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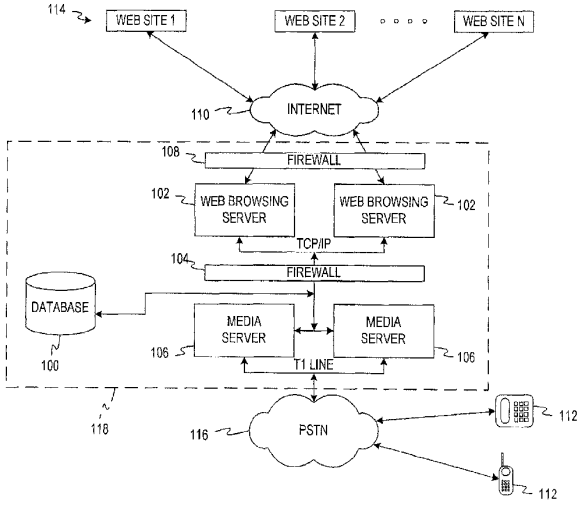
(57) **ABSTRACT**

The present invention relates to a system for acquiring information from sources on a network, such as the Internet. A voice browsing system maintains a database containing a list of information sources, such as web sites, connected to a network. Each of the information sources is assigned a rank number which is listed in the database along with the record for the information source. In response to a speech command received from a user, a network interface system accesses the information source with the highest rank number in order to retrieve information requested by the user.

15 Claims, 4 Drawing Sheets



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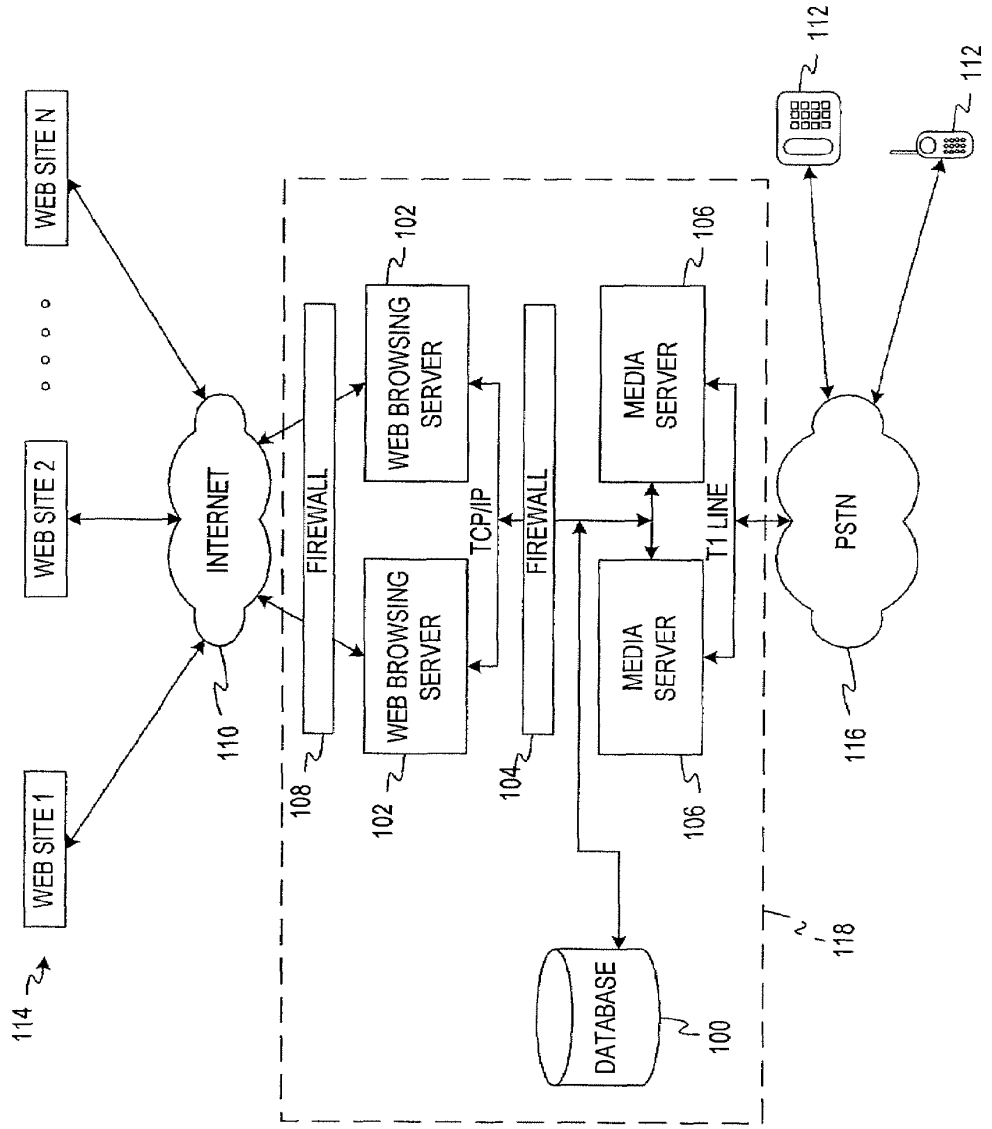

WEB SITE N
WEB SITE 2
WEB SITE 1
INTERNET
FIREWALL
WEB BROWSING SERVER
WEB BROWSING SERVER
TCP/IP
FIREWALL
MEDIA SERVER
MEDIA SERVER
T1 LINE
PSTN
DATABASE
110
108
102
102
104
106
106
116
118
100
114
112
112

FIG. 1

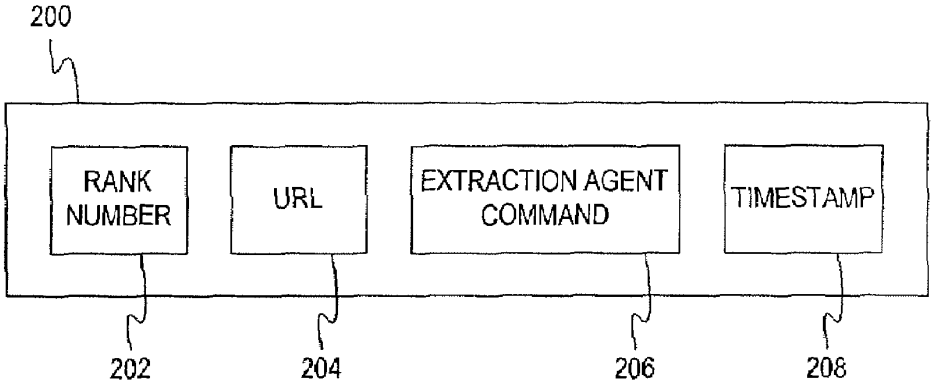

200
RANK NUMBER
URL
EXTRACTION AGENT COMMAND
TIMESTAMP
202
204
206
208

FIG. 2

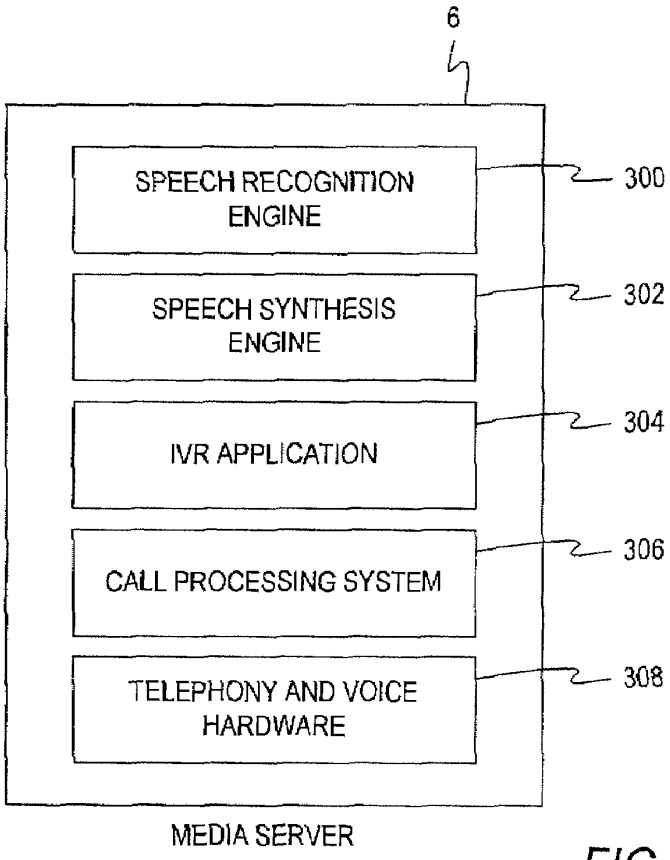

6
SPEECH RECOGNITION ENGINE
300
SPEECH SYNTHESIS ENGINE
302
IVR APPLICATION
304
CALL PROCESSING SYSTEM
306
TELEPHONY AND VOICE HARDWARE
308
MEDIA SERVER

FIG. 3

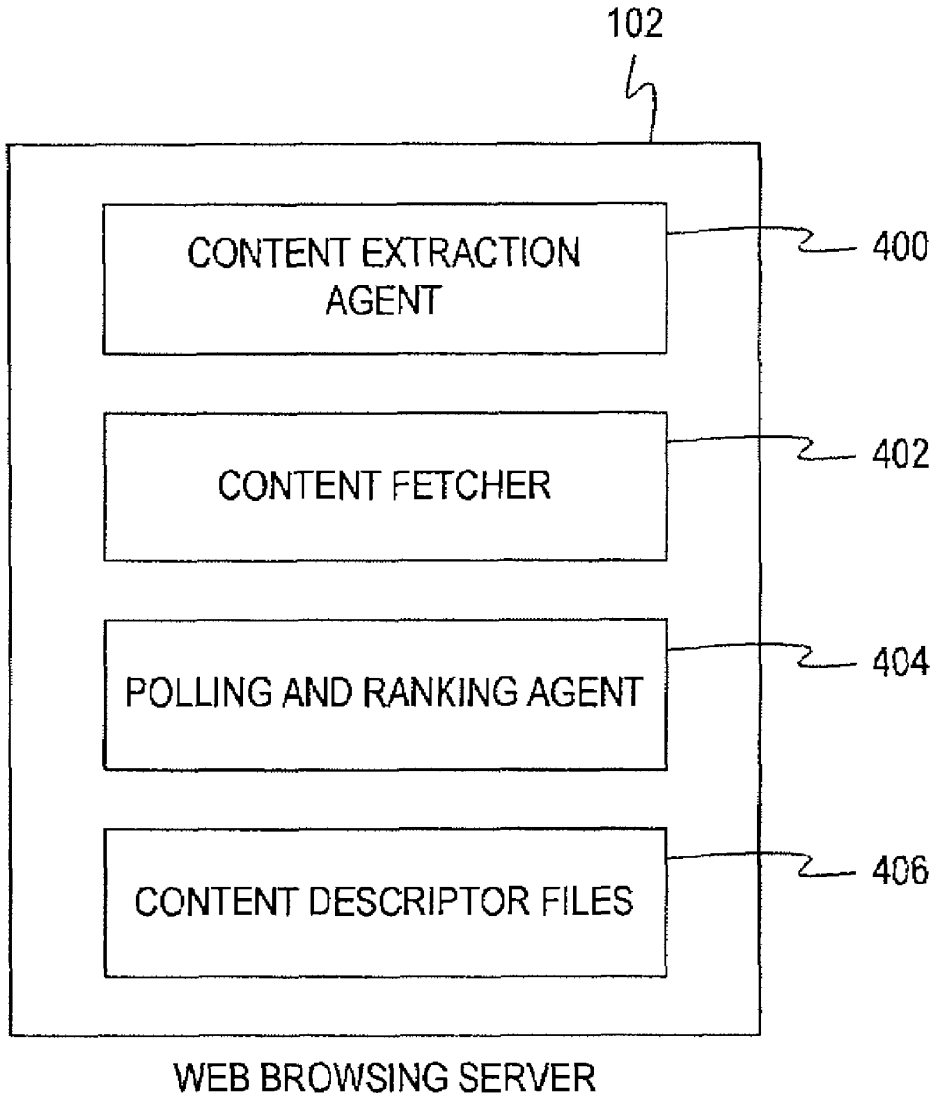
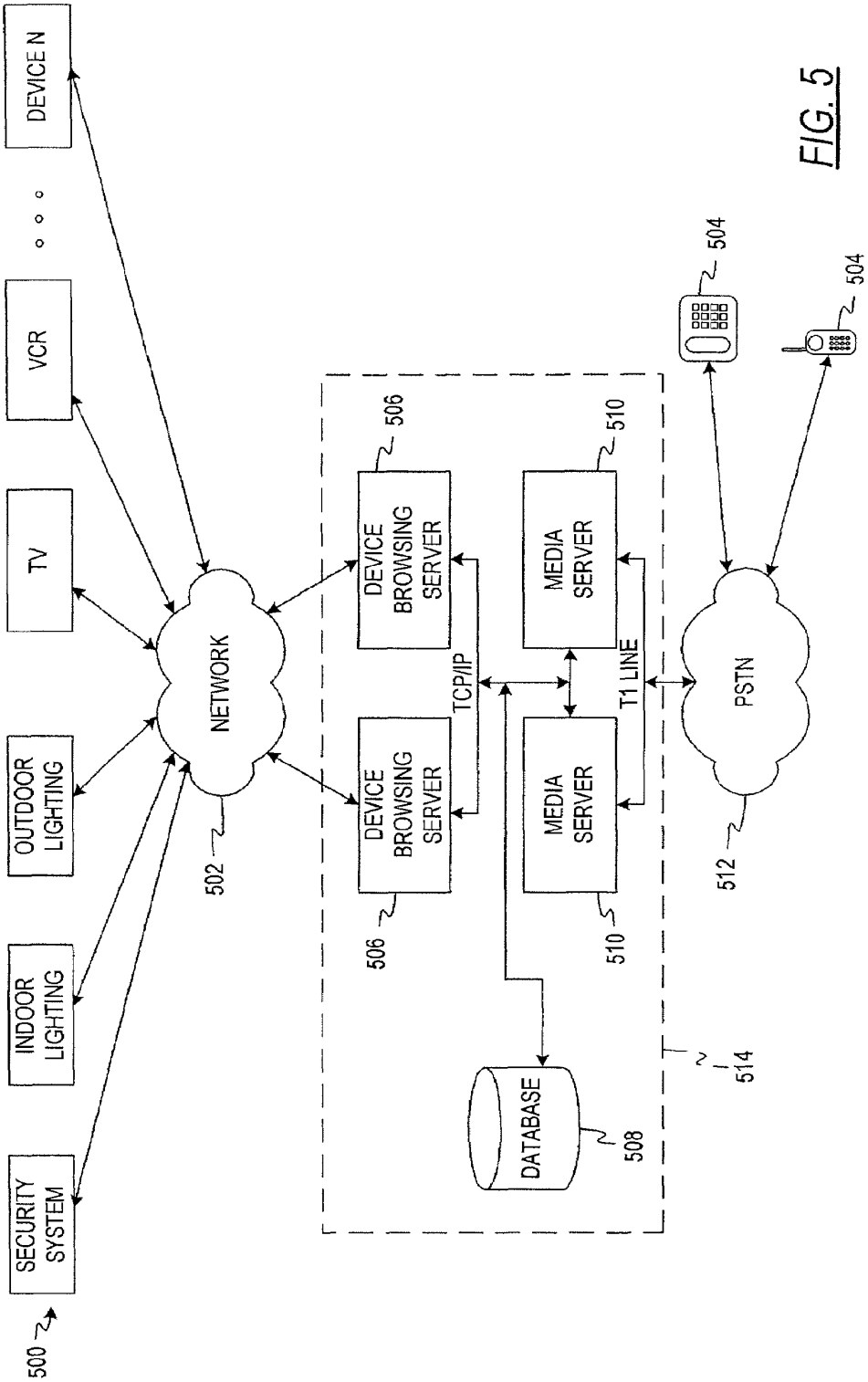

102
CONTENT EXTRACTION AGENT
400
CONTENT FETCHER
402
POLLING AND RANKING AGENT
404
CONTENT DESCRIPTOR FILES
406
WEB BROWSING SERVER

FIG. 4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VCR
TV
OUTDOOR LIGHTING
INDOOR LIGHTING
SECURITY SYSTEM
500
NETWORK
502
DEVICE BROWSING SERVER
506
DEVICE BROWSING SERVER
506
TCP/IP
MEDIA SERVER
510
MEDIA SERVER
510
T1 LINE
DATABASE
508
514
PSTN
512
504
504

FIG. 5

ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 11/409,703, filed Apr. 24, 2006, now allowed, which is a continuation of U.S. patent application Ser. No. 10/821,690, filed Apr. 9, 2004 and issued as U.S. Pat. No. 7,076,431 on Jul. 11, 2006, which is a continuation of U.S. patent application Ser. No. 09/776,996, filed Feb. 5, 2001 and issued as U.S. Pat. No. 6,721,705 on Apr. 13, 2004, which claims the benefit of priority to U.S. Provisional Application No. 60/180,344, filed Feb. 4, 2000, entitled "Voice-Activated Information Retrieval System" and U.S. Provisional Application No. 60/233,068, filed Sep. 15, 2000, entitled "Robust Voice Browser System and Voice Activated Device Controller", all of which are herein incorporated by reference in their entirety.

FIELD OF THE INVENTION

The present invention relates to a robust and highly reliable system that allows users to browse web sites and retrieve information by using conversational voice commands. Additionally, the present invention allows users to control and monitor other systems and devices that are connected the Internet or any other network by using voice commands.

BACKGROUND OF THE INVENTION

Currently, three options exist for a user who wishes to gather information from a web site accessible over the Internet. The first option is to use a desktop or a laptop computer connected to a telephone line via a modem or connected to a network with Internet access. The second option is to use a Personal Digital Assistant (PDA) that has the capability of connecting to the Internet either through a modem or a wireless connection. The third option is to use one of the newly designed web-phones or web-pagers that are now being offered on the market. Although each of these options provide a user with access to the Internet to browse web sites, each of them have their own drawbacks.

Desktop computers are very large and bulky and are difficult to transport. Laptop computers solve this inconvenience, but many are still quite heavy and are inconvenient to carry. Further, laptop computers cannot be carried and used everywhere a user travels. For instance, if a user wishes to obtain information from a remote location where no electricity or communication lines are installed, it would be nearly impossible to use a laptop computer. Oftentimes, information is needed on an immediate basis where a computer is not accessible. Furthermore, the use of laptop or desktop computers to access the Internet requires either a direct or a dial-up connection tan an Internet Service Provider (ISP). Oftentimes, such connections are not available when a user desires to connect to the Internet to acquire information.

The second option for remotely accessing web sites is the use of PDAs. These devices also have their own set of drawbacks. First, PDAs with the ability to connect to the Internet and access web sites are not readily available. As a result, these PDAs tend to be very expensive. Furthermore, users are usually required to pay a special service fee to enable the web browsing feature of the PDA. A further disadvantage of these PDAS is that web sites must be specifically designed to allow these devices to access information on the web site. Therefore, a limited number of web sites are available that are accessible by these web-enabled PDAs. Finally, it is very common today for users to carry cell phones, however, users must also carry a separate PDA if they require the ability to gather information from various web sites. Users are therefore subjected to added expenses since they must pay for both cellular telephone service and also for the web-enabling service for the PDA. This results in a very expensive alternative for the consumer.

The third alternative mentioned above is the use of web-phones or web-pagers. These devices suffer many of the same drawbacks as PDAs. First, these devices are expensive to purchase. Further, the number of web sites accessible to these devices is limited since web sites must be specifically designed to allow access by these devices. Furthermore, users are often required to pay an additional fee in order to gain wireless web access. Again, this service is expensive. Another drawback of these web-phones or web-pagers is that as technology develops, the methods used by the various web sites to allow access by these devices may change. These changes may require users to purchase new web-phones or web-pagers or have the current device serviced in order to upgrade the firmware or operating system stored within the device. At the least, this would be inconvenient to users and may actually be quite expensive.

Therefore, a need exists for a system that allows users to easily access and browse the Internet from any location. Such a system would only require users to have access to any type of telephone and would not require users to subscribe to multiple services.

In the rapidly changing area of Internet applications, web sites change frequently. The design of the web site may change, the information required by the web site in order to perform searches may change, and the method of reporting search results may change. Web browsing applications that submit search requests and interpret responses from these web sites based upon expected formats will produce errors and useless responses when such changes occur. Therefore, a need exists for a system that can detect modifications to web sites and adapt to such changes in order to quickly and accurately provide the information requested by a user through a voice enabled device, such as a telephone.

When users access web sites using devices such as personal computers, delays in receiving responses are tolerated and are even expected, however, such delays are not expected when a user communicates with a telephone. Users expect communications over a telephone to occur immediately with a minimal amount of delay time. A user attempting to find information using a telephone expects immediate responses to his search requests. A system that introduces too much delay between the time a user makes a request and the time of response will not be tolerated by users and will lose its usefulness. Therefore, it is important that a voice browsing system that uses telephonic communications selects web sites that provide rapid responses since speed is an important factor for maintaining the system's desirability and usability. Therefore, a need exists for a system that accesses web sites based upon their speed of operation.

SUMMARY OF THE INVENTION

It is an object of an embodiment of the present invention to allow users to gather information from web sites by using voice enabled devices, such as wireline or wireless telephones.

An additional object of an embodiment of the present invention is to provide a system and method that allows the

searching and retrieving of publicly available information by controlling a web browsing server using naturally spoken voice commands.

It is an object of another embodiment of the present invention to provide a robust voice browsing system that can obtain the same information from several web sites based upon a ranking order. The ranking order is automatically adjusted if the system detects that a given web site is not functioning, is too slow, or has been modified in such a way that the requested information cannot be retrieved any longer.

A still further object of an embodiment of the present invention is to allow users to gather information from web sites from any location where a telephonic connection can be made.

Another object of an embodiment of the present invention is to allows users to browse web sites on the Internet using conversational voice commands spoken into wireless or wireline telephones or other voice enabled devices.

An additional object an embodiment of the present invention is to provide a system and method for using voice commands to control and monitor devices connected to a network.

It is an object of an embodiment of the present invention to provide a system and method which allows devices connected to a network to be controlled by conversational voice commands spoken into any voice enabled device interconnected with the same network.

The present invention relates to a system for acquiring information from sources on a network, such as the Internet. A voice browsing system maintains a database containing a list of information sources, such as web sites, connected to a network. Each of the information sources is assigned a rank number which is listed in the database along with the record for the information source. In response to a speech command received from a user, a network interface system accesses the information source with the highest rank number in order to retrieve information requested by the user.

The a preferred embodiment of the present invention allows users to access and browse web sites when they do not have access to computers with Internet access. This is accomplished by providing a voice browsing system and method that allows users to browse web sites using conversational voice commands spoken into any type of voice enabled device (i.e., any type of wireline or wireless telephone, IP phone, wireless PDA, or other wireless device). These spoken commands are then converted into data messages by a speech recognition software engine running on a user interface system. These data messages are then sent to and processed by a network interface system. This network interface system then generates the proper requests that are transmitted to the desired web site over the Internet. Responses sent from the web site are received and processed by the network interface system and then converted into an audio message via a speech synthesis engine or a pre-recorded audio concatenation application and finally transmitted to the user's voice enabled device.

A preferred embodiment of the voice browser system and method uses a web site polling and ranking methodology that allows the system to detect changes in web sites and adapt to those changes in real-time. This enables the voice browser system of a preferred embodiment to deliver highly reliable information to users over any voice enabled device. This ranking system also enables the present invention to provide rapid responses to user requests. Long delays before receiving responses to requests are not tolerated by users of voice-based systems, such as telephones. When a user speaks into a telephone, an almost immediate response is expected. This expectation does not exist for non-voice communications, such as email transmissions or accessing a web site using a personal computer. In such situations, a reasonable amount of transmission delay is acceptable. The ranking system of implemented by a preferred embodiment of the present invention ensures users will always receive the fastest possible response to their request.

An alternative embodiment of the present invention allows users to control and monitor the operation of a variety of household devices connected to a network using speech commands spoken into a voice enabled device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a depiction of the voice browsing system of the first embodiment of the present invention;

FIG. **2** is a block diagram of a database record used by the first preferred embodiment of the present invention;

FIG. **3** is a block diagram of a media server used by the preferred embodiment;

FIG. **4** is a block diagram of a web browsing server used by the preferred embodiment; and

FIG. **5** is a depiction of the device browsing system of the second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A first embodiment of the present invention is a system and method for allowing users to browse information sources, such as web sites, by using naturally spoken, conversational voice commands spoken into a voice enabled device. Users are not required to learn a special language or command set in order to communicate with the voice browsing system of the present invention. Common and ordinary commands and phrases are all that is required for a user to operate the voice browsing system. The voice browsing system recognizes naturally spoken voice commands and is speaker-independent; it does not have to be trained to recognize the voice patterns of each individual user. Such speech recognition systems use phonemes to recognize spoken words and not predefined voice patterns.

The first embodiment allows users to select from various categories of information and to search those categories for desired data by using conversational voice commands. The voice browsing system of the first preferred embodiment includes a user interface system referred to as a media server. The media server contains a speech recognition software engine. This speech recognition engine is used to recognize natural, conversational voice commands spoken by the user and converts them into data messages based on the available recognition grammar. These data messages are then sent to a network interface system. In the first preferred embodiment, the network interface system is referred to as a web browsing server. The web browsing server then accesses the appropriate information source, such as a web site, to gather information requested by the user.

Responses received from the information sources are then transferred to the media server where speech synthesis engine converts the responses into audio messages that are transmitted to the user. A more detailed description of this embodiment will now be provided.

Referring to FIG. **1**, a database **100** designed by Webley Systems Incorporated is connected to one or more web browsing servers **102** as well as to one or more media servers **106**. The database may store information on magnetic media, such as a hard disk drive, or it may store information via other widely acceptable methods for storing data, such as optical

disks. The database **100** contains a separate set of records for each web site accessible by the system. An example of a web site record is shown in FIG. **2**. Each web site record **200** contains the rank number of the web site **202**, the associated Uniform Resource Locator (URL) **204**, and a command that enables the appropriate "extraction agent" **206** that is required in order to generate proper requests sent to and to format data received from the web site. The database record **200** also contains the timestamp **208** indicating the last time the web site was accessed. The extraction agent is described in more detail below. The database **100** categorizes each database record **200** according to the type of information provided by each web site. For instance, a first category of database records **200** may correspond to web sites that provide "weather" information. The database **100** may also contain a second category of records **200** for web sites that provide "stock" information. These categories may be further divided into subcategories. For instance, the "weather" category may contain subcategories depending upon type of weather information available to a user, such as "current weather" or "extended forecast". Within the "extended forecast" subcategory, a list of web site records may be stored that provide weather information for multiple days. The use of subcategories may allow the web browsing feature to provide more accurate, relevant, and up-to-date information to the user by accessing the most relevant web site. The number of records contained in each category or subcategory is not limited. In the preferred embodiment, three web site records are provided for each category.

Table 1 below depicts two database records **200** that are used with the preferred embodiment. These records also contain a field indicating the "category" of the record, which is "weather" in each of these examples.

TABLE 1

category:	weather
URL:	URL=http: //cgi .cnn.com/cgi-bin/weather/redirect? zip= zip
rank:	1
command:	web_dispatch .pl weather_cnn
browsingserver:	wportal1
browsingServerBackup:	wportal2
dateTime:	Dec 21 2000 2:15PM
category:	weather
URL:	URL=http: //weather.lycos.com/wcfiveday.asp?city=zip
rank:	2
command:	web_dispatch.pl weather_lycos
browsingServer:	wportal1
browsingserverBackup:	wportal2
dateTime:	Dec 21 2000 1:45PM

The database also contains a listing of pre-recorded audio files used to create concatenated phrases and sentences. Further, database **100** may contain customer profile information, system activity reports, and any other data or software servers necessary for the testing or administration of the voice browsing system.

The operation of the media servers **106** will now be discussed in relation to FIG. **3**. The media servers **106** function as user interface systems. In the preferred embodiment, the media servers **106** contain a speech recognition engine **300**, a speech synthesis engine **302**, an Interactive Voice Response (IVR) application **304**, a call processing system **306**, and telephony and voice hardware **308** required to communicate with the Public Switched Telephone Network (PSTN) **116**. In the preferred embodiment, each media server is based upon Intel's Dual Pentium III 730 microprocessor system.

The speech recognition function is performed by a speech recognition engine **300** that converts voice commands received from the user's voice enabled device **112** (i.e., any type of wireline or wireless telephone, Internet Protocol (IP) phones, or other special wireless units) into data messages. In the preferred embodiment, voice commands and audio messages are transmitted using the PSTN **116** and data is transmitted using the TCP/IP communications protocol. However, one skilled in the art would recognize that other transmission protocols may be used for either voice or data. Other possible transmission protocols would include SIP/VoIP (Session Initiation Protocol/Voice over IP), Asynchronous Transfer Mode (ATM) and Frame Relay. A preferred speech recognition engine is developed by Nuance Communications of 1380 Willow Road, Menlo Park, Calif. 94025 (www.nuance.com). The Nuance engine capacity is measured in recognition units based on CPU type as defined in the vendor specification. The natural speech recognition grammars (i.e., what a user can say that will be recognized by the speech recognition engine) were developed by Webley Systems.

Table 2 below provides a partial source code listing of the recognition grammars used by the speech recognition engine of the preferred embodiment for obtaining weather information.

TABLE 2

```
?WHAT_IS ?the weather ?[info information report conditions]
        ? ( (?like in )
        ]
UScities:n
        {<param1 $n.zip> <param2 $n.city> <param3
        $n.state>}
        ( (area code) AREA_CODE:n ) {<param1 $n>}
        ( AREA_CODE:n (area code) ) {<param1 $n>}
        ( (zip ?code) ZIP_CODE:n ) {<param1 $n>}
        ( ZIP_CODE:n (zip ?code) ) {<param1 $n>}
        ]
        )
                ) {<menu 194>}
```

The media server **106** uses recognition results generated by the speech recognition engine **300** to retrieve a web site record **200** stored in the database **100** that can provide the information requested by the user. The media server **106** processes the recognition result data identifying keywords that are used to search the web site records **200** contained in the database **100**. For instance, if the user's request was "What is the weather in Chicago?", the keywords "weather" and "Chicago" would be recognized. A web site record **200** with the highest rank number from the "weather" category within the database **100** would then be selected and transmitted to the web browsing server **102** along with an identifier indicating that Chicago weather is being requested.

The media servers **106** also contain a speech synthesis engine **302** that converts the data retrieved by the web browsing servers **102** into audio messages that are transmitted to the user's voice enabled device **112**. A preferred speech synthesis engine is developed by Lernout and Hauspie Speech Products, 52 Third Avenue, Burlington, Mass. 01803 (www.lhsl.com).

A further description of the web browsing server **102** will be provided in relation to FIG. **4**. The web browsing servers **102** provide access to any computer network such as the Internet **110**. These servers are also capable of accessing databases stored on Local Area Networks (LANs) or Wide Area Networks (WANs). The web browsing servers receive responses from web sites and extract the data requested by the user. This task is also known as "content extraction." The web browsing servers **102** also perform the task of periodically polling or "pinging" various web sites and modifying the

ranking numbers of these web sites depending upon their response and speed. This polling feature is further discussed below. The web browsing server **102** is comprised of a content extraction agent **400**, a content fetcher **402**, a polling and ranking agent **404**, and the content descriptor files **406**. Each of these are software applications and will be discussed below.

Upon receiving a web site record **200** from the database **100** in response to a user request, the web browsing server **102** invokes the "content extraction agent" command **206** contained in the record **200**. The content extraction agent **400** allows the web browsing server **102** to properly format requests and read responses provided by the web site **114** identified in the URL field **204** of the web site record **200**. Each content extraction agent command **206** invokes the content extraction agent and identifies a content description file associated with the web page identified by the URL **204**. This content description the directs the extraction agent where to extract data from the accessed web page and how to format a response to the user utilizing that data. For example, the content description for a web page providing weather information would indicate where to insert the "city" name or ZIP code in order to retrieve Chicago weather information. Additionally, the content description file for each supported URL indicates the location on the web page where the response information is provided. The extraction agent **400** uses this information to properly extract from the web page the information requested by the user.

Table 3 below contains source code for a content extraction agent **400** used by the preferred embodiment.

TABLE 3

```
#! /usr/local/www/bin/sybper15
#$Header:
/usr/local/cvsroot/webley/agents/service/web_dispatch.pl, v
1.6
# Dispatches all web requests
#http://wcorp.itn.net/cgi/flstat?carrier=ua&flightno=155&mo
nabbr=jul&date=
6&stamp=OhLN~PdbuuE*itn/ord, itn/cb/sprint_hd
#http://cgi.cnnfn.com/flightview/rlm?airline=amt&number=300
require "config_tmp.pl";
# check parameters
die "Usage: $0 service [params]\n" if $#ARGV < 1;
#print STDERR @ARGV;
* get parameters
my ( $service, @param ) = @ARGV;
# check service
my %Services = (
                    weather_cnn => 'webget.pl weather_cnn',
                    weather lycos => 'webget.pl
weather lycos',
                    weather_weather => 'webget.pl
weather_weather',
                    weather_snap => 'webget.pl
weather_snap',
                    weather_infospace => 'webget.pl
weather_infospace',
                    stockQuote_yahoo => 'webget.pl stock',
                    flightstatusitn => 'webget.pl
flight_delay',
                    yellowPages_yahoo => 'yp_data.pl',
                    yellowPages_yahoo => 'yp_data.pl',
                    newsHeaders_newsreal => 'news.pl',
                    newsArticle_newsreal => 'news.pl',
# test param
my $date = 'date';
chop ( $date );
my ( $short_date ) = $date =~ /\s+(\w{3}\s+\d{1,2})\s+/;
my %Test = (
                    weather_cnn => '60053',
                    weather lycos => '60053',
                    weather_weather => '60053',
                    weather_snap => '60053',
                    weather_infospace => '60053',
                    stockQuote_yahoo => 'msft',
                    flightStatus_itn => 'ua 155 '.
$ short_date,
                    yellowPages_yahoo => 'tires 60015',
                    newsHeaders_newsreal => '1',
                    newsArticle_newsreal => '1 1',
die "$date: $0: error: no such service: $service (check this
script) \n"
unless $Services{$service };
# prepare absolute path to run other scripts
my ( $path, $script) = $0 =~ m|(.*/) ([^/]*)|;
# store the service to compare against datatable
my $service_stored = $service;
# run service
while( !( $response = '$path$Services{$service }@param' ) )
{
    # response failed
    # check with test parameters
    $response = '$path$Services{$service }$Test{$service
}';
#   print "test: $path$Services{$service }$Test{$service
}";
    if ( $response ) {
        $service = &switch_service ( $service );
#       print "Wrong parameter values were supplied:
$service -
@param\n";
#       die "$date: $0: error: wrong parameters: $service
-
@param\n";
    }
    else {
        # change priority and notify
        $service = &increase_attempt( $service );
    }
}
# output the response
print $response;
sub increase_attempt {
    my ( $service ) = @_;
    my ( $service_name ) = split ( /_/, $service );
    print STDERR "$date: $0: attn: changing priority for
service:
$service\n";
    # update priority
    &db_query( "update mcServiceRoute "
                . "set priority = ( select max( priority )
from
mcServiceRoute
                . "where service = '$service_name' ) + 1,
"
                . "date = getdate( ), "
                . "attempt = attempt + 1 "
                . "where route = '$script $service'" );
#   print "---$route===\n";
    # find new route
    my $route = @{&db_query( "select route from
mcServiceRoute "
                                . "where service =
'$service name'
                                . "and attempt < 5
"
                                . "order by
priority ")
                        }-> [ 0 ]{route };
    &db_query( "update mcServiceRoute "
                . "set attempt = 0 "
                . "where route = '$script $service'"
        if ( $route eq "$script $service"
            or $route eq "$script $service_stored" );
    ( $service_name, $service ) = split( /\s+/, $route );
    die "$date: $0: error: no route for the service:
$service (add
more) \n"
        unless $service;
    return $service;
}
```

TABLE 3-continued

```
sub switch_service {
    my ( $service ) = @_;
    my ( $service_name ) = split( /_/, $service );
    print STDERR "$date: $0: attn: changing priority for
service:
$service\n";
    # update priority
    &db_query( "update mcServiceRoute "
                . "set priority = ( select max ( priority )
from
mcServiceRoute "
                . "where service = '$service_name' ) + 1,
"
                . "date = getdate( ) "
                "where route = '$script $service'" );
#   print "---$route===\n";
    # find new route
    my $route = @{&db_query( "select route from
mcServiceRoute "
                                . "where service =
'$service name' "
                                . "and attempt < 5
"
                                . "order by
priority ")
                        }-> 1 0 ){route };
    die "$date: $0: error: there is the only service:
$route (add
more) \n"
        if ( $route eq "$script $service"
            or $route eq "$script $service_stored" );
    ( $service name, $service ) = split( /\s+/, $route );
    die "$date: $0: error: no route for the service:
$service (add
more) \n"
        unless $service;
    return $service;
} _
```

Table 4 below contains source code of the content fetcher **402** used with the content extraction agent **400** to retrieve information from a web site.

TABLE 4

```
#! /usr/local/www/bin/sybperls
#-T
#    -w
#    $Header:
/usr/local/cvsroot/webley/agents/service/webget .pl,v 1.4
# Agent to get info from the web.
# Parameters: service_name Eservice_parameters] , i.e. stock
msft or weather
60645
# configuration stored in files service_name.ini
# if this file is absent the configuration is received from
mcServices table
# This script provides autoupdate to datatable if the .ini
file is newer.
$debug = 1;
use URI::URL;
use LWP::UserAgent;
use HTTP::Request::Common;
use Vail::VarList;
use Sybase::CTlib;
use HTTP::cookies;
#print "Sybase::CTlib $DB_USR, $DB_PWD, $DB_SRV;";
open( STDERR, ">>$0.log" ) if $debug;
#open( STDERR, ">&STDOUT" );
$log = 'date';
#$response = './url.pl "http://cgi.cnn.com/cgi-
bin/weather/redirect?zip=60605"';
#$response = 'pwd';
#print STDERR "pwd = $response\n";
#$response = 'ls';
#print STDERR "is = $response\n";
chop( $log );
$log .= "pwd=" . 'pwd';
chop( $log );
#$debug2 = 1;
my $service = shift;
$log .= " $service: ". join( ':', @ARGV ) . "\n";
print STDERR $log if $debug;
#$response = './url.pl
"http://cgi.cnn.com/cgi-bin/weather/redirect?zip=60605"';
my @ini = &read_ini ( $service );
chop( @ini );
my $section = "";
do {$section = &process_section( $section ) }while $section;
#$response = './url.pi
"http://cgi.cnn.com/cgi-bin/weather/redirect'izip=60605"';
exit;
sub read_ini {
    my ( $service ) = my @ini = 0;
    # first, try to read file
    $0 =~ m|^(.*/) [^/]*|;
    $service = $1 . $service;
    if ( open( INI, "$service.ini" ) ) {
        @ini = ( <INI> );
        return @ini unless ( $DB_SRV);
        # update datatable
        my $file_time = time – int( ( -M "$service.ini" )
* 24 *
3600 )
#       print "time $file_time\n";
        my $dbh = new Sybase::CTlib $DB_USR, $DB_PWD,
$DB_SRV;
        unless ( $dbh ) {
            print STDERR "webget.pl: Cannot connect to
dataserver $DB_SRV:$DB_USR:$DB_PWD\n";
            return @ini;
        }
        my @row_refs = $dbh->ct_sql( "select lastUpdate
from
mcServices where service = '$service'", undef, 1 );
        if ( $dbh->{Rc }== cs_FAIL ) {
            print STDERR "webget.pl: DB select from
mcServices
failed\n";
            return @ini;
        }
        unless ( defined @row_refs ) {
            # have to insert
            my ( @ini_escaped ) = map {
                ( my $x = $_ ) =~ } s/\'/\'\'/g
            $dbh->ct_sql( "insert mcServices values(
'$service'
'@ini_escaped', $file_time ) ');
            if ( $dbh->{Rc }== CS_FAIL ) {
                print STDERR "webget.pl: DB insert to
mcServices failed\n";
            }
            return @ini;
        }
#       print "time $file_time:".$row_refs [ 0 ]-
> {' lastUpdate'
} . " \n"
        if ( $file_time > $row_refs [ 0 ] -> {'lastUpdate' })
 {
            # have to update
            my ( @ini_escaped ) = map {
                ( my $x = $_) =~ s/\'/\'\'/g;
                $x;
            }@ini;
            $dbh->ct_sql( "update mcServices set config =
'@ini_escaped', lastUpdate = $file_time where service =
'$service'" );
            if( $dbh->{RC }== CS_FAIL ) {
                print STDERR "webget.pl: DB update to
mcServices failed\n";
            }
        }
        return @ini;
    }
    else {
        print STDERR "$0: WARNING: $service.ini n/a in " .
```

TABLE 4-continued

```
'pwd'
                . "Try to read DB\n";
    }
    # then try to read datatable
    die "webget.pl: Unable to find service $service\n"
unless ( $DB__SRV
);
    my $dbh = new Sybase::CTlib $DB__USR, $DB__PWD, $DB__SRV;
    die "webget.pl: Cannot connect to dataserver
$DB__SRV:$DB__USR:$DB__PWD\n" unless ( $dbh );
    my @row__refs = $dbh->ct__sql( "select config from
mcServices where
service = '$service'", undef, 1 );
    die "webget.pl: DB select from mcServices failed\n" if
$dbh->{RC }
== CS__FAIL;
    die "webget.pl: Unable to find service $service\n"
unless ( defined
@row__refs );
    $row__refs [ 0 ]->{'config' }=____ s/\n /\n\r/g;
    @ini = split( /\r/, $row__refs [ 0 ] ->{'config' });
    return @ini;
}    -
##################################################
sub process__section {
    my ( $prev__section ) = my ( $section, $output, $content );
    my %Param;
    my %content;
#   print "#####################################\n";
    foreach ( @ini ) {
#   print;
#   chop;
    s/\s+$//;
    s/^\s+//;
    # get section name
    if ( /~\[(.*)\]/ ) {
#           print "$__: $section:$prev__section\n";
            last if $section;
            next if $1 eq "print";
#           next if $prev__section ne " and $prev__section
ne$1;
            if ( $prev__section eq $1 ) {
                $prev__section = "";
                next;
            }
            $section $1;
        }
        # get parameters
        push( @{$Param{$1 }}, $2 ) if $section and
/([^=]+)=(.*)/;
    }
#   print"++++++++++++++++++++++++++++++++++\n";
    return 0 unless $section;
#   print "section $section\n";
    # substitute parameters with values
    map {$Param{URL }->[ 0 ] =~ s/$Param{Input }->[ $__
]/$ARGV[ $__
]/g
    }0 .. $#{$Param{Input }};
    # get page content
    ( $content{'TIME' }, $content) = &geturlcontent(
${$Param{URL
}}[ 0] );
    # filter it
    map {
        if( /\" ( [^\"] +)\"([^\"]*)\"/ or
/\/([^\/]+)\/([^\/*)\// )
{
            my $out = $2; $content =____ s/$1/$out/g;
        }
    }@{$Param{"Pre-filter" }};
#print STDERR $content;
    # do main regular expression
    unless( @values = $content =~
/${$Param{Regular__expression }} [ 0
]/ ) {
        &die__hard( ${$Param{Regular__expression }} [ 0 ],
$content
);
        return $section;
    }
    %content = map {( $Param(Ourput }->[ $__ ], $values[ $__
])
    }0 .. $*{$Param{Output }};
    # filter it
    map {
        if ( / ( [^\"] +) \" ([^\"] +) \"([^\"]*) \"/
            or / ( [^\/] +) \/ ( [^\/] +) \/ ( ( ^\/] *) \// ) {
            my $out = $3;
            $content{$1 }=~ s/$2/$out/g;
        }
    }@{$Param{"Post-filter" }};
    # calculate it
    map
        if ( /([^=]+)=(.*)/ ) {
            my $eval = $2;
            map {$eval =~. s/$/$Content{$ }/g
            }keys %Content;
          $content{$1 }= eval( $eval );
        }
    }@{$Param{Calculate }};
    # read section [print]
    foreach $i ( 0 . . $*ini ) {
        next unless $ini[ $i ] =~ /^\[.+\]/;
        foreach ( $i + 1 . . $#ini ) {
          last if $ini[ $__ ] =~ /^\[.+\]/;
          $output .= $ini[ $__ ] . "\n";
        }
        last;
    }
    # prepare output
    map {$output =~ s/$__/$Content{$__ }/g
    }keys %Content;
    print $output;
    return 0;
}
##################################################
sub get__url content {
    my ( $url ) = @__;
    print STDERR $url if $debug;
#   $response = './url.pl "$url"';
    $response = './url.pl "$url"';
    return( $time – time, $response );
    my $ua = LWP::UserAgent->new;
    $ua->agent( 'Mozilla/4.0 [en] (X11; I; FreeBSD 2.2.8-
STABLE i386)'
);
#   ua->proxy( ['http', 'https'],
'http://proxy.webley:3128/' );
#   $ua->no__proxy( 'webley', 'vail' );
    my $cookie = HTTP::Gookies->new;
    $ua->cookie__jar( $cookie );
    $url = url $url;
    print "$unl\n" if $debug2;
    my $time = time;
    my $res = $ua->request( GET $uri );
    print "Response: " . (time – $time) . "sec\n" if
$debug2;
    return( $time – time, $res->content );
}
##################################################
sub die__hard {
    my( $re, $content) =
    my ( $re__end, $pattern );
    while( $content /$re/ ) {
        if ( $re =~ s/ (\ ( [^\ (\) ] +\) [^\ (\)] *$)// ) }
          $re end = $1 . $re end;
        }
        else {
            $re__end = $re;
            last;
        }
    }
    $content =~ /$re/;
    print STDERR "The regular expression did not match:\n
$ re\n
Possible misuse:
$re__end: \n
```

TABLE 4-continued

```
Matched:
$&\n
Mismatched:
$`\n
“ if $debug;
        if ( $debug ) {
            print STDERiR “Content:\n $content\n” unless
$’;
        }
}
################################################
```

Table 5 below contains the content descriptor file source code for obtaining weather information from the web site www.cnn.com that is used by the extraction agent **400** of the preferred embodiment.

TABLE 5

```
[cnn]
Input=__zip
URL=http: //cgi .cnn.com/cgi-bin/weather/redinect?zip= zip
Pre-filter=”\n”
Pre-filter=”<[^< >]+>””
Pre-filter=/\s+/ /
Pre-filter=” (\()\\]“!”
Output=__location
Output=first__day__name
Output=first__day__weather
Output=first__day__high__F
Output=first__day__high__c
Output=first__day__low__F
Output=first__day__low__c
Output=second__day__name
Output=second__day__weather
Output=second__day__high__F
Output=second__day__high__c
Output=second__day__low__F
Output=second__day__low__c
Output=third__day__name
Output=third__day__weather
Output=third__day__high__F
Output=third__day__high__c
Output=thind__day__low__F
Output=thind__day__low__c
Output=fourth__day__name
Output=fourth__day__weather
Output=fourth__day__high__F
Output=fourth__day__high__c
Output=fourth__day__low__F
Output=fourth__day__low__c
Output=undef
Output=__cunrent__time
Output=__current__month
Output=__current__day
Output=__current__weather
Output=__current__tempenature__F
Output=__current__temperature__c
Output=__humidity
Output=__wind
Output=__pressure
Output=__sunrise
Output=__sunset
Regular__expression=Author   (.+) Four Day Forecast
(\S+) (\S+) HIGH
(\s+) F (\S+) C LOW (\S+) F (\S+) C (\S+) (\S+) HIGH (\S+) F
(\S+) C LOW
(\S+) F (\S+) C (\S+) (\S+) HIGH (\S+) F (\S+) C LOW (\S+) F
(\S+) C (\S+)
(\S+) HIGH (\S+) F (\S+) C LOW (\S+) F (\S+) C (.+) Current
Conditions(.+)
!local!, (\S+) (\S+) (.+) Temp: (\S+) F, (\S+) C Rel.
Humidity: (\S+) Wind:
(.+) Pressure: (.+) Sunrise: (.+) Sunset: (.+) Related Links
Post-filter=__current__weather”p/”partly”
Post-filter=__current__weather” l/”little”
```

TABLE 5-continued

```
Post-filter=__current__weather”m/”mostly”
Post-filter=__current__weathen”t-/”thunder”
Post-filter=__wind”N”North”
Post-filter=__wind”E”East”
Post-filter=__wind”s”South”
Post-filter=__wind”W”West”
Post-filter=__wind/mph/miles per hour/
Post-filter=__wind/kph! /kilometers per hour/
Post-filter=__wind”\s+!”,”
[print]
Current weather in __location is __current__weather.
Temperature is __current__temperature__F Fahrenheit,
__current__temperature__C
Celsius.
Humidity is __humidity.
Wind from the __wind.
```

Table 6 below contains the content descriptor file source code for obtaining weather information from the web site www.lycos.com that is used by the extraction agent **400** of the preferred embodiment.

TABLE 6

```
[lycos]
Input=zip
Input=__city
URL=http://weather.lycos.com/wcfiveday.asp?city=zip
Pre-filter=”\n”
Pne-filter=”</TD>”td”
Pre-filter=”<! .*?__>““
Pre-filter=”<br>” br__”
Pre-filter=/alt”/>alt=/
Pre-filter=”<[^< >]+>””
Pre-filter=” ”
Pre-filter=/\s+/ /
Output=__location
Output=__current__weather
Output=__current__temperature__F
Output=__humidity
Output=__winddir
Output=__windspeed
Output=__windmeasure
Output=__pressure
Output=finst__day__name
Output=second__day__name
Output=thind__day__name
Output=fourth__day__name
Output=fifth__day__name
Output=first__day__weather
Output=second__day__weather
Output=third__day__weather
Output=founth__day__weather
Output=fifth__day__weather
Output=first__day__high__F
Output=first__day__low__F
Output=second__day__high__F
Output=second__day__low__F
Output=thind__day__high__F
Output=third__day__low__F
Output =fourth__day__high__F
Output=fourth__day__low__F
Output=fifth__day__high__F
Output=fifth__day__low__F
Output=__windkmh
Regular expression=Guide My Lycos (.+) Click image to
enlarge
alt=([^”]+)”(?:.+) Temp: (\d+)(?:.+)F __br__Humidity:
(\S+) (?: .+) Wind:
__br__
Output =__current__temperature__C
Post-filter=__location”__br__”
Post-filter=__current__weather”p/”partly”
Post-filter=__current__weather”m/”mostly”
Post-filter=__current__weather”t-/”thunder”
Post-filter=__winddir”@” at”
```

TABLE 6-continued

```
Post-filter=__winddir/mph/miles pen hour/
Post-filter=__wind/kph!/kilometens per hour/
Calculate=__current__temperature__C=int ( (__current__temperature__F
-32) *5/9)
Calculate=__windkmh=int (__windspeed*1.6)
[print]
The current weather in __location is __current__weather.
The current temperature is __current__temperature__F Fanenheit
__current__temperature__C Celsius.
Humidity is __humidity.
Winds __winddir.
```

Once the web browsing server **102** accesses the web site specified in the URL **204** and retrieves the requested information, the information is forwarded to the media server **106**. The media server uses the speech synthesis engine **302** to create an audio message that is then transmitted to the user's voice enabled device **112**. In the preferred embodiment, each web browsing server **102** is based upon Intel's Dual Pentium III 730 MHz microprocessor system.

Referring to FIG. **1**, the operation of the robust voice browser system will be described. A user establishes a connection between his voice enabled device **112** and a media server **106**. This may be done using the Public Switched Telephone Network (PSTN) **116** by calling a telephone number associated with the voice browsing system **118**. Once the connection is established, the media server **106** initiates an interactive voice response (WR) application **304**. The IVR application plays audio messages to the user presenting a list of options, such as, "stock quotes", "flight status", "yellow pages", "weather", and "news". These options are based upon the available web site categories and may be modified as desired. The user selects the desired option by speaking the name of the option into the voice enabled device **112**.

As an example, if a user wishes to obtain restaurant information, he may speak into his telephone the phrase "yellow pages". The FIR application would then ask the user what he would like to find and the user may respond by stating "restaurants". The user may then be provided with further options related to searching for the desired restaurant. For instance, the user may be provided with the following restaurant options, "Mexican Restaurants", "Italian Restaurants", or "American Restaurants". The user then speaks into the telephone **112** the restaurant type of interest. The IVR application running on the media server **106** may also request additional information limiting the geographic scope of the restaurants to be reported to the user. For instance, the IVR application may ask the user to identify the zip code of the area where the restaurant should be located. The media server **106** uses the speech recognition engine **300** to interpret the speech commands received from the user. Based upon these commands, the media server **106** retrieves the appropriate web site record **200** from the database **100**. This record and any additional data, which may include other necessary parameters needed to perform the user's request, are transmitted to a web browsing server **102**. A firewall **104** may be provided that separates the web browsing server **102** from the database **100** and media server **106**. The firewall provides protection to the media server and database by preventing unauthorized access in the event the firewall for web browsing server **108** fails or is compromised. Any type of firewall protection technique commonly known to one skilled in the art could be used, including packet filter, proxy server, application gateway, or circuit-level gateway techniques.

The web browsing server **102** then uses the web site record and any additional data and executes the extraction agent **400** and relevant content descriptor file **406** to retrieve the requested information.

The information received from the responding web site **114** is then processed by the web browsing server **102** according to the content descriptor file **406** retrieval by the extraction agent. This processed response is then transmitted to the media server **106** for conversion into audio messages using either the speech synthesis software **302** or selecting among a database of prerecorded voice responses contained within the database **100**.

As mentioned above, each web site record contains a rank number **202** as shown in FIG. **2**. For each category searchable by a user, the database **100** may list several web sites, each with a different rank number **202**. As an example, three different web sites may be listed as searchable under the category of "restaurants". Each of those web sites will be assigned a rank number such as 1, 2, or 3. The site with the highest rank (i.e., rank=1) will be the first web site accessed by a web browsing server **102**. If the information requested by the user cannot be found at this first web site, then the web browsing server **102** will search the second ranked web site and so forth down the line until the requested information is retrieved or no more web sites left to check.

The web site ranking method and system of the present invention provides robustness to the voice browser system and enables it to adapt to changes that may occur as web sites evolve. For instance, the information required by a web site **114** to perform a search or the format of the reported response data may change. Without the ability to adequately monitor and detect these changes, a search requested by a user may provide an incomplete response, no response, or an error. Such useless responses may result from incomplete data being provided to the web site **114** or the web browsing server **102** being unable to recognize the response data messages received from the searched web site **114**.

The robustness and reliability of the voice browsing system of the present invention is further improved by the addition of a polling mechanism. This polling mechanism continually polls or "pings" each of the sites listed in the database **100**. During this polling function, a web browsing server **102** sends brief data requests or "polling digital data" to each web site listed in database **100**. The web browsing server **102** monitors the response received from each web site and determines whether it is a complete response and whether the response is in the expected format specified by the content descriptor file **406** used by the extraction agent **400**. The polled web sites that provide complete responses in the format expected by the extraction agent **400** have their ranking established based on their "response lime". That is, web sites with faster response times will be will be assigned higher rankings than those with slower response times. If the web browsing server **102** receives no response from the polled web site or if the response received is not in the expected format, then the rank of that web site is lowered. Additionally, the web browsing server contains a warning mechanism that generates a warning message or alarm for the system administrator indicating that the specified web site has been modified or is not responsive and requires further review.

Since the web browsing servers **102** access web sites based upon their ranking number, only those web sites that produce useful and error-free responses will be used by the voice browser system to gather information requested by the user. Further, since the ranking numbers are also based upon the speed of a web site in providing responses, only the most time efficient sites are accessed. This system assures that users will

get complete, timely, and relevant responses to their requests. Without this feature, users may be provided with information that is not relevant to their request or may not get any information at all. The constant polling and re-ranking of the web sites used within each category allows the voice browser of the present invention to operate efficiently. Finally, it allows the voice browser system of the present invention to dynamically adapt to changes in the rapidly evolving web sites that exist on the Internet.

It should be noted that the web sites accessible by the voice browser of the preferred embodiment may use any type of mark-up language, including Extensible Markup Language (XML), Wireless Markup Language (WML), Handheld Device Markup Language (HDML), Hyper Text Markup Language (HTML), or any variation of these languages.

A second embodiment of the present invention is depicted in FIG. **5**. This embodiment provides a system and method for controlling a variety of devices **500** connected to a network **502** by using conversational speech commands spoken into a voice enabled device **504** (i.e., wireline or wireless telephones, Internet Protocol (IP) phones, or other special wireless units). The networked devices may include various household devices. For instance, voice commands may be used to control household security systems, VCRs, TVs, outdoor or indoor lighting, sprinklers, or heating and air conditioning systems.

Each of these devices **500** is connected to a network **502**. These devices **500** may contain embedded microprocessors or may be connected to other computer equipment that allow the device **500** to communicate with network **502**. In the preferred embodiment, the devices **500** appear as "web sites" connected to the network **502**. This allows a network interface system, such as a device browsing server **506**, a database **508**, and a user interface system, such as a media server **510**, to operate similar to the web browsing server **102**, database **100** and media server **106** described in the first preferred embodiment above. A network **502** interfaces with one or more network interface systems, which are shown as device browsing servers **506** in FIG. **5**. The device browsing servers perform many of the same functions and operate in much the same way as the web browsing servers **102** discuss above in the first preferred embodiment. The device browsing servers **506** are also connected to a database **508**.

Database **508** lists all devices that are connected to the network **502**. For each device **500**, the database **508** contains a record similar to that shown in FIG. **2**. Each record will contain at least a device identifier, which may be in the form of a URL, and a command to "content extraction agent" contained in the device browsing server **506**. Database **508** may also include any other data or software necessary to test and administer the device browsing system.

The content extraction agent operates similarly to that described in the first embodiment. A device descriptor file contains a listing of the options and functions available for each of the devices **500** connected on the network **502**. Furthermore, the device descriptor file contains the information necessary to properly communicate with the networked devices **500**. Such information would include, for example, communication protocols, message formatting requirements, and required operating parameters.

The device browsing server **506** receives messages from the various networked devices **500**, appropriately formats those messages and transmits them to one or more media servers **510** which are part of the device browsing system. The user's voice enabled devices **504** can access the device browsing system by calling into a media server **510** via the Public Switched Telephone Network (PSTN) **512**. In the preferred embodiment, the device browsing server is based upon Intel's Dual Pentium III 730 MHz microprocessor system.

The media servers **510** act as user interface systems and perform the functions of natural speech recognition, speech synthesis, data processing, and call handling. The media server **510** operates similarly to the media server **106** depicted in FIG. **3**. When data is received from the device browser server **506**, the media server **510** will convert the data into audio messages via a speech synthesis engine that are then transmitted to the voice enabled device of the user **504**. Speech commands received from the voice enabled device of the user **504** are converted into data messages via a speech recognition engine running on the media server **510**. A preferred speech recognition engine is developed by Nuance Communications of 1380 Willow Road, Menlo Park, Calif. 94025 (www.nuance.com). A preferred speech synthesis engine is developed by Lernout and Hauspie Speech Products, 52 Third Avenue, Burlington, Mass. 01803 (www.lhsl.com). The media servers **510** of the preferred embodiment are based on Intel's Dual Pentium III 730 MHz microprocessor system. A specific example for using the system and method of this embodiment of the invention will now be given.

First, a user may call into a media server **510** by dialing a telephone number associated with an established device browsing system. Once the user is connected, the IVR application of the media server **510** will provide the user with a list of available systems that may be monitored or controlled based upon information contained in database **508**.

For example, the user may be provided with the option to select "Home Systems" or "Office Systems". The user may then speak the command "access home systems". The media server **510** would then access the database **508** and provide the user with a listing of the home subsystems or devices **500** available on the network **502** for the user to monitor and control. For instance, the user may be given a listing of subsystems such as "Outdoor Lighting System", "Indoor Lighting System", "Security System", or "Heating and Air Conditioning System". The user may then select the indoor lighting subsystem by speaking the command "Indoor Lighting System". The IVR application would then provide the user with a set of options related to the indoor lighting system. For instance the media server **510** may then provide a listing such as "Dining Room", "Living Room", "Kitchen", or "Bedroom". After selecting the desired room, the IVR application would provide the user with the options to hear the "status" of the lighting in that room or to "turn on", "turn off", or "dim" the lighting in the desired room. These commands are provided by the user by speaking the desired command into the users voice enabled device **504**. The media server **510** receives this command and translates it into a data message. This data message is then forwarded to the device browsing server **506** which routes the message to the appropriate device **500**.

The device browsing system **514** of this embodiment of the present invention also provides the same robustness and reliability features described in the first embodiment. The device browsing system **514** has the ability to detect whether new devices have been added to the system or whether current devices are out-of-service. This robustness is achieved by periodically polling or "pinging" all devices **500** listed in database **508**. The device browsing server **506** periodically polls each device **500** and monitors the response. If the device browsing server **506** receives a recognized and expected response from the polled device, then the device is categorized as being recognized and in-service. However, if the device browsing server **506** does not receive a response from

the polled device **500** or receives an unexpected response, then the device **500** is marked as being either new or out-of-service. A warning message or a report may then be generated for the user indicating that a new device has been detected or that an existing device is experiencing trouble.

Therefore, this embodiment allows users to remotely monitor and control any devices that are connected to a network, such as devices within a home or office. Furthermore, no special telecommunications equipment is required for users to remotely access the device browser system. Users may use any type of voice enabled device (i.e., wireline or wireless telephones, IP phones, or other wireless units) available to them. Furthermore, a user may perform these functions from anywhere without having to subscribe to additional services. Therefore, no additional expenses are incurred by the user.

The descriptions of the preferred embodiments described above are set forth for illustrative purposes and are not intended to limit the present invention in any manner. Equivalent approaches are intended to be included within the scope of the present invention. While the present invention has been described with reference to the particular embodiments illustrated, those skilled in the art will recognize that many changes and variations may be made thereto without departing from the spirit and scope of the present invention. These embodiments and obvious variations thereof are contemplated as falling within the scope and spirit of the claimed invention.

What is claimed is:

1. A method for retrieving information from pre-selected web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:

providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;

providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;

providing at least one instruction set stored in a database operatively connected to said computer, said instruction set comprising:

a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;

providing a speech command to said speaker-independent speech recognition engine, said speech command corresponding to said instruction set;

said speaker-independent speech recognition engine assigning said speech command to a recognition grammar, said speech command and said recognition grammar corresponding to said instruction set;

transmitting said speech command to said speaker-independent speech recognition engine;

said speaker-independent speech recognition engine receiving said speech command and selecting the corresponding recognition grammar upon receiving said speech command;

said computer retrieving said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition engine;

said computer accessing at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer first accessing said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;

said speech synthesis engine producing an audio message containing any retrieved information from said pre-selected web sites; and

said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

2. The method of claim **1** wherein said instruction set further comprises a. content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

3. The method of claim **1** wherein said instruction set further comprises a ranking from highest to lowest associated with each said web site, said ranking indicating the order in which the plurality of pre-selected web sites are accessed.

4. The method of claim **3** wherein said computer accesses said plurality of web sites based on said ranking, said computer first accessing said web site having the highest ranking

5. The method of claim **4** further comprising the step of adjusting said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings.

6. The method of claim **1** further comprising the step of periodically polling each said web site to determine whether said web site contains said information to be retrieved.

7. The method of claim **6** wherein the computer periodically polls each said web site without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site, said computer creating a ranking of said plurality of web sites based on said periodic polling.

8. The method of claim **1** further comprising the step of periodically searching said internet to find new web sites containing said information to be retrieved, and adding said new web sites to said plurality of web sites.

9. A system for retrieving information from pre-selected web sites by uttering speech commands into a phone and for providing to users retrieved information in an audio form via said phone, said system comprising:

a computer, said computer operatively connected to the internet and to at least one phone;

at least one speaker-independent speech recognition engine, said speaker- independent speech recognition engine operatively connected to said computer;

at least one speech synthesis engine, said speech synthesis engine operatively connected to said computer;

a database, said database operatively connected to said computer;

at least one instruction set stored in said database for identifying said information to be retrieved, said instruction set comprising:

a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;

a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved;

a ranking from highest to lowest associated with each said web site address, said ranking indicating the order in which the plurality of pre-selected web sites are accessed;

at least one recognition grammar stored in said database, each said recognition grammar corresponding to each said instruction set and corresponding to a speech command;

said speaker-independent speech recognition engine configured to receive from users via said phone a speech command and to select the corresponding recognition grammar upon receiving said speech command;

said computer configured to retrieve said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition device;

said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said web site having the highest ranking and, if said information to be retrieved is not found at said web site having the highest ranking, said computer configured to subsequently access said plurality of web sites in order of rankings until said information to be retrieved is found or until said plurality of web sites has been accessed;

said computer further configured to establish or adjust said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings;

said speech synthesis engine configured to produce an audio message containing any retrieved information from said pre-selected web sites, and said speech synthesis engine further configured to transmit said audio message to said users via said phone.

10. The system of claim **9** wherein said phone comprises a standard telephone, a cellular phone, or an IP phone.

11. The system of claim **9** wherein said internet is a local area network.

12. The system of claim **9** wherein said internet is a wide area network.

13. The system of claim **9** wherein said internet is the Internet.

14. The system of claim **9** wherein said computer is configured to establish or adjust said rankings associated with said plurality of web sites when instructed by said user to access said plurality of web sites to retrieve said information.

15. The system of claim **9** wherein said computer is configured to establish or adjust said rankings associated with said plurality of web sites based on periodic polling of each of said web sites without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site.

* * * * *

US008185402B2

(12) **United States Patent**
Kurganov et al.

(10) **Patent No.: US 8,185,402 B2**
(45) **Date of Patent: *May 22, 2012**

(54) **ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/973,475**

(22) Filed: **Dec. 20, 2010**

(65) **Prior Publication Data**

US 2011/0091023 A1 Apr. 21, 2011

Related U.S. Application Data

(63) Continuation of application No. 12/030,556, filed on Feb. 13, 2008, now Pat. No. 7,881,941, which is a continuation of application No. 11/409,703, filed on Apr. 24, 2006, now Pat. No. 7,386,455, which is a continuation of application No. 10/821,690, filed on Apr. 9, 2004, now Pat. No. 7,076,431, which is a continuation of application No. 09/776,996, filed on Feb. 5, 2001, now Pat. No. 6,721,705.

(60) Provisional application No. 60/180,344, filed on Feb. 4, 2000, provisional application No. 60/233,068, filed on Sep. 15, 2000.

(51) **Int. Cl.**
G10L 21/06 (2006.01)

(52) **U.S. Cl.** **704/275**; 379/88.17

(58) **Field of Classification Search** 704/275; 379/88.17
See application file for complete search history.

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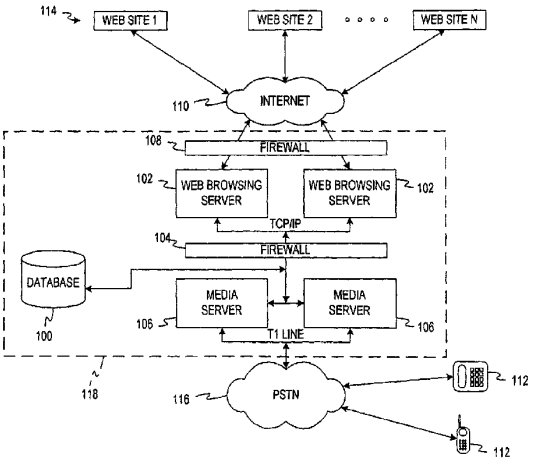
(57) **ABSTRACT**

The present invention relates to a system for acquiring information from sources on a network, such as the Internet. A voice browsing system maintains a database containing a list of information sources, such as web sites, connected to a network. Each of the information sources is assigned a rank number which is listed in the database along with the record for the information source. In response to a speech command received from a user, a network interface system accesses the information source with the highest rank number in order to retrieve information requested by the user.

15 Claims, 4 Drawing Sheets



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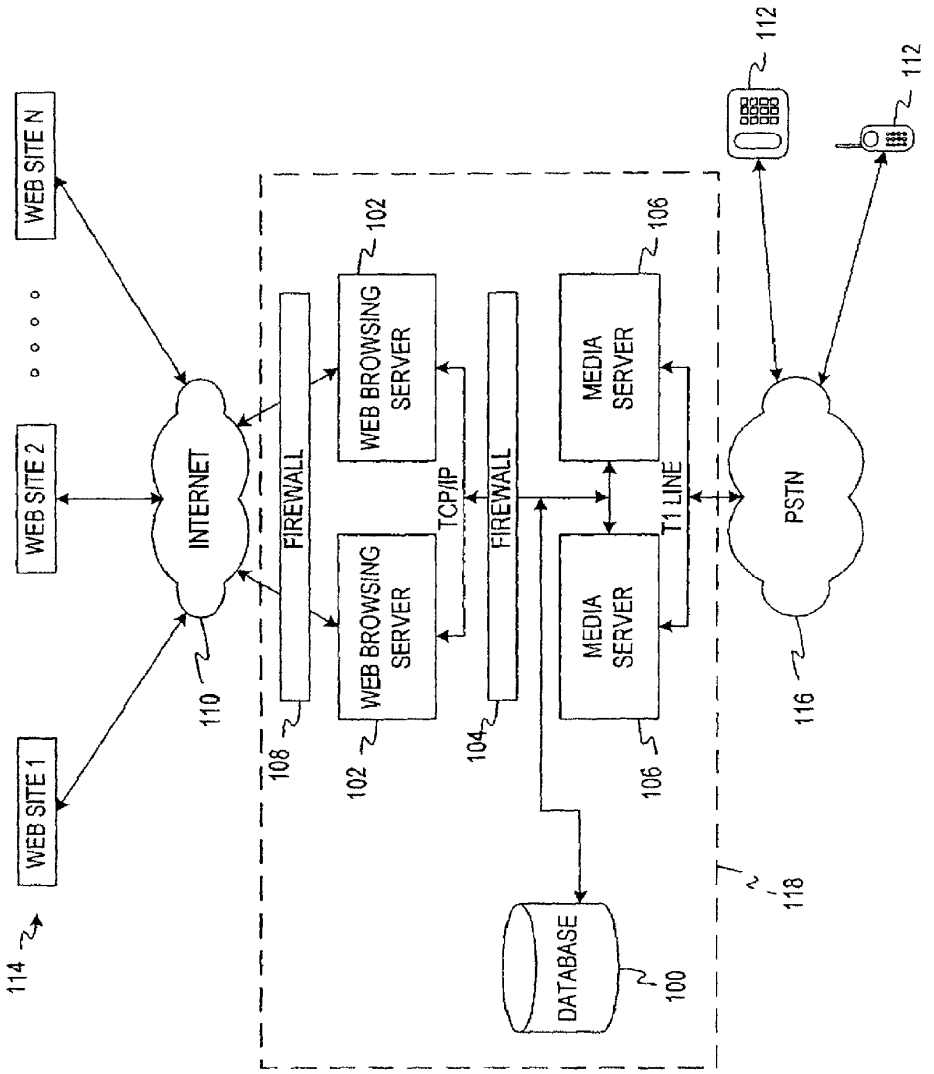
WEB SITE N
WEB SITE 2
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INTERNET
110
FIREWALL
108
WEB BROWSING SERVER
102
WEB BROWSING SERVER
102
TCP/IP
FIREWALL
104
MEDIA SERVER
106
MEDIA SERVER
106
T1 LINE
PSTN
116
112
112
DATABASE
100
118

FIG. 1

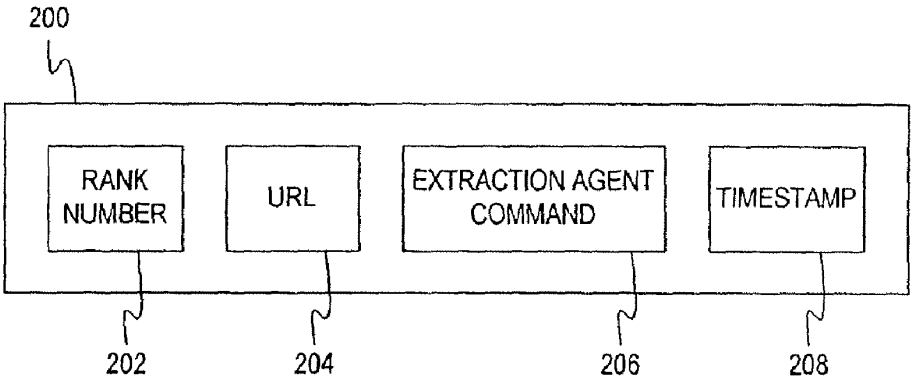
200
RANK NUMBER
URL
EXTRACTION AGENT COMMAND
TIMESTAMP
202
204
206
208

FIG. 2

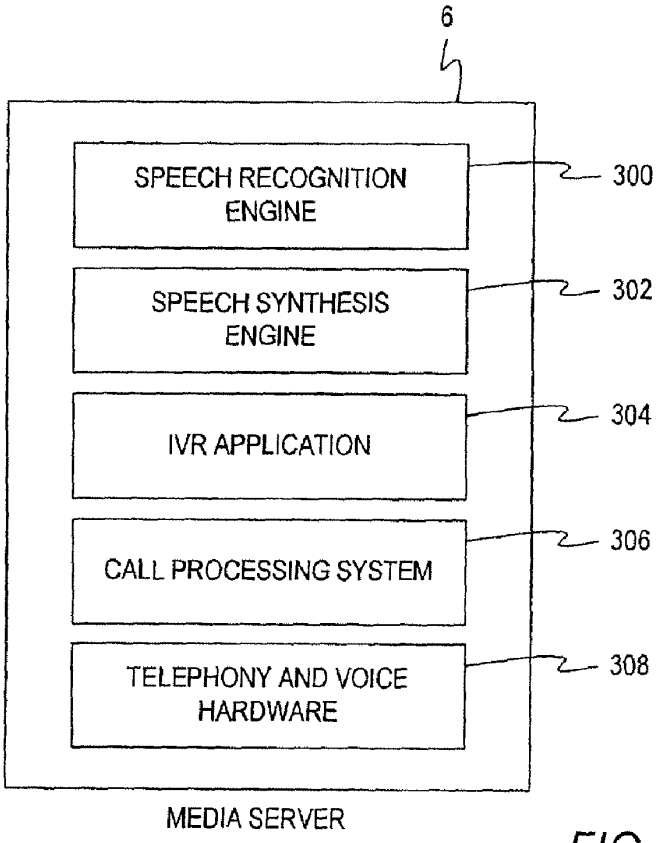
6
SPEECH RECOGNITION ENGINE
300
SPEECH SYNTHESIS ENGINE
302
IVR APPLICATION
304
CALL PROCESSING SYSTEM
306
TELEPHONY AND VOICE HARDWARE
308
MEDIA SERVER

FIG. 3

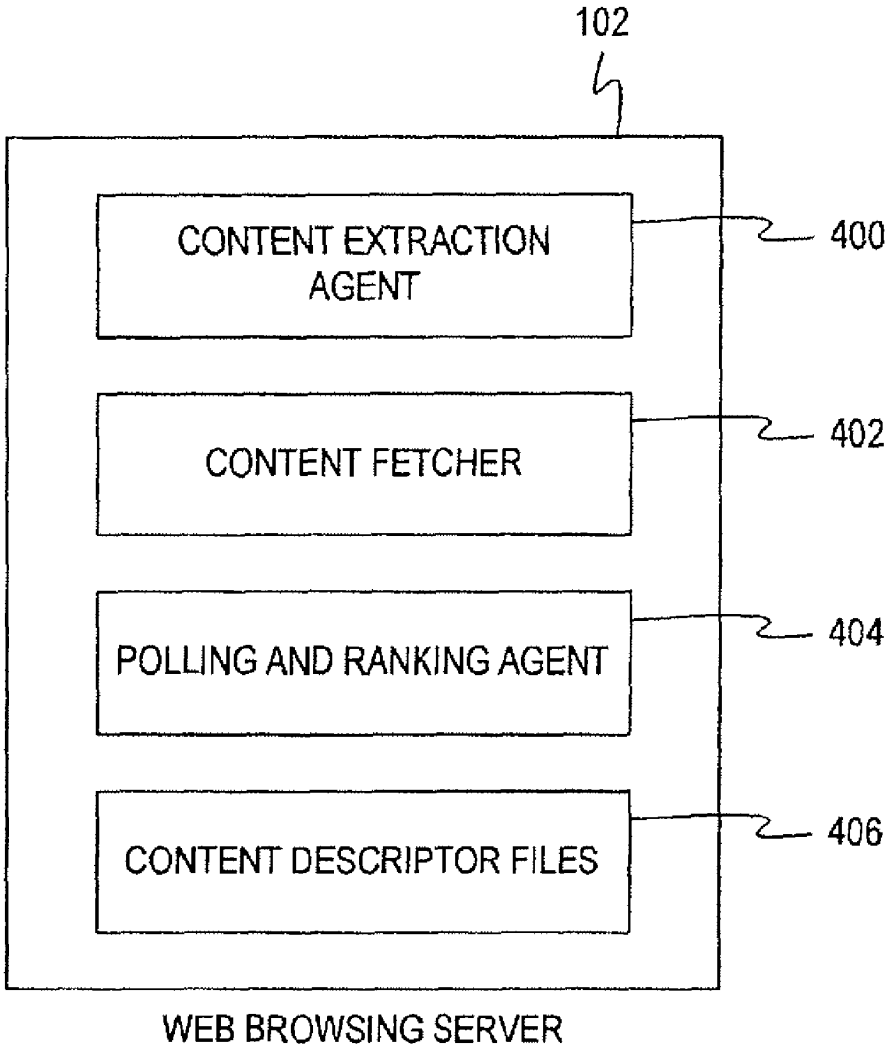
102
CONTENT EXTRACTION AGENT
400
CONTENT FETCHER
402
POLLING AND RANKING AGENT
404
CONTENT DESCRIPTOR FILES
406
WEB BROWSING SERVER

FIG. 4

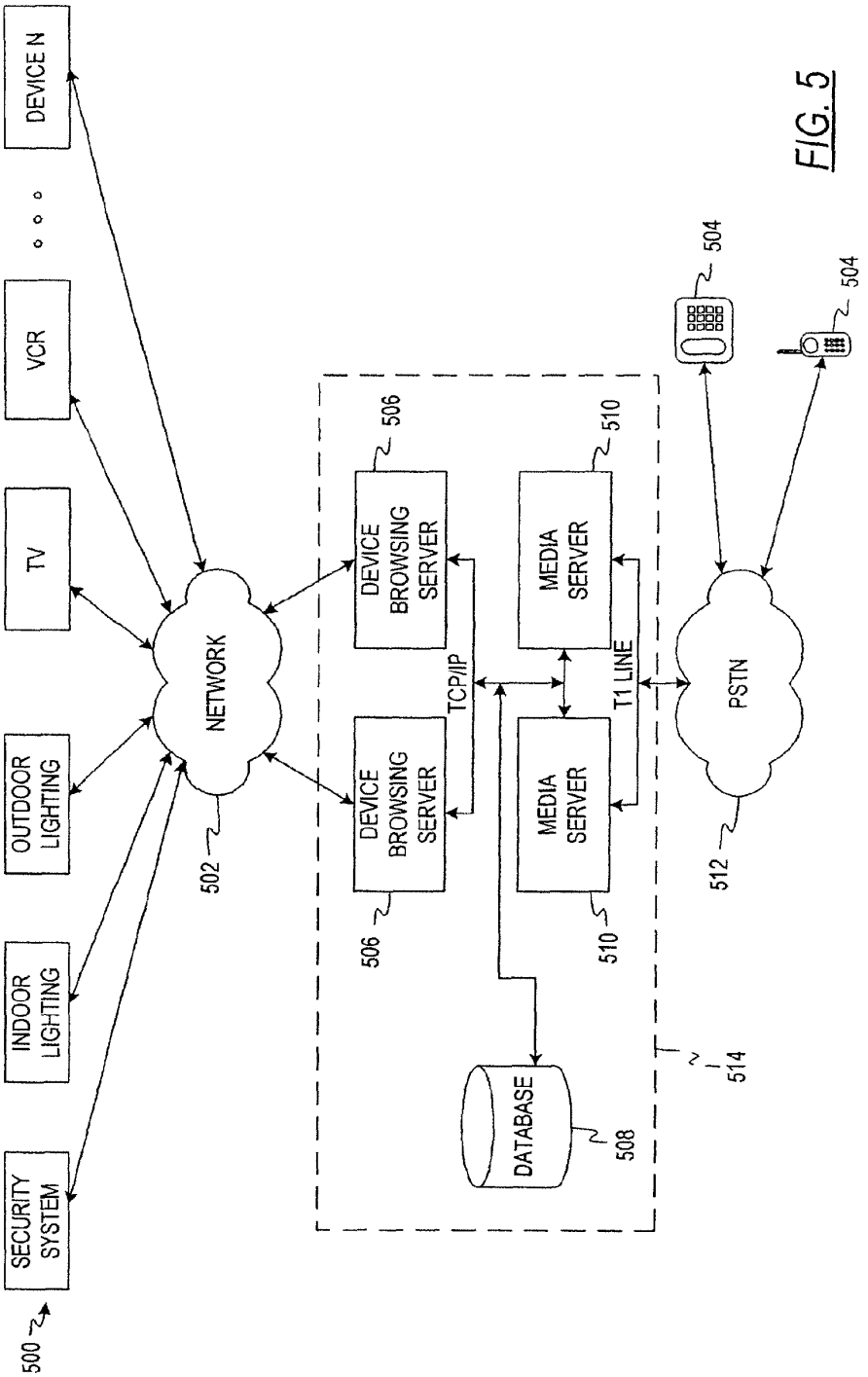
DEVICE N
VCR
TV
OUTDOOR LIGHTING
INDOOR LIGHTING
SECURITY SYSTEM
500
NETWORK
502
DEVICE BROWSING SERVER
506
DEVICE BROWSING SERVER
506
TCP/IP
MEDIA SERVER
510
MEDIA SERVER
510
T1 LINE
DATABASE
508
514
PSTN
512
504
504

FIG. 5

ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 12/030,556, filed Feb. 13, 2008, now allowed, which is a continuation of U.S. patent application Ser. No. 11/409,703, filed Apr. 24, 2006 and issued as U.S. Pat. No. 7,386,455 on Jun. 10, 2008, which is a continuation of U.S. patent application Ser. No. 10/821,690, filed Apr. 9, 2004 and issued as U.S. Pat. No. 7,076,431 on Jul. 11, 2006, which is a continuation of U.S. patent application Ser. No. 09/776,996, filed Feb. 5, 2001 and issued as U.S. Pat. No. 6,721,705 on Apr. 13, 2004, which claims the benefit of priority to U.S. Provisional Application No. 60/180,344, filed Feb. 4, 2000, entitled "Voice Activated Information Retrieval System" and U.S. Provisional Patent Application No. 60/233,068, filed Sep. 15, 2000, entitled "Robust Voice Browser System and Voice Activated Device Controller", all of which are herein incorporated by reference in their entirety.

FIELD OF THE INVENTION

The present invention relates to a robust and highly reliable system that allows users to browse web sites and retrieve information by using conversational voice commands. Additionally, the present invention allows users to control and monitor other systems and devices that are connected the Internet or any other network by using voice commands.

BACKGROUND OF THE INVENTION

Currently, three options exist for a user who wishes to gather information from a web site accessible over the Internet. The first option is to use a desktop or a laptop computer connected to a telephone line via a modem or connected to a network with Internet access. The second option is to use a Personal Digital Assistant (PDA) that has the capability of connecting to the Internet either through a modem or a wireless connection. The third option is to use one of the newly designed web-phones or web-pagers that are now being offered on the market. Although each of these options provide a user with access to the Internet to browse web sites, each of them have their own drawbacks.

Desktop computers are very large and bulky and are difficult to transport. Laptop computers solve this inconvenience, but many are still quite heavy and are inconvenient to carry. Further, laptop computers cannot be carried and used everywhere a user travels. For instance, if a user wishes to obtain information from a remote location where no electricity or communication lines are installed, it would be nearly impossible to use a laptop computer. Oftentimes, information is needed on an immediate basis where a computer is not accessible. Furthermore, the use of laptop or desktop computers to access the Internet requires either a direct or a dial-up connection tan an Internet Service Provider (ISP). Oftentimes, such connections are not available when a user desires to connect to the Internet to acquire information.

The second option for remotely accessing web sites is the use of PDAs. These devices also have their own set of drawbacks. First, PDAs with the ability to connect to the Internet and access web sites are not readily available. As a result, these PDAs tend to be very expensive. Furthermore, users are usually required to pay a special service fee to enable the web browsing feature of the PDA. A further disadvantage of these

PDAS is that web sites must be specifically designed to allow these devices to access information on the web site. Therefore, a limited number of web sites are available that are accessible by these web-enabled PDAs. Finally, it is very common today for users to carry cell phones, however, users must also carry a separate PDA if they require the ability to gather information from various web sites. Users are therefore subjected to added expenses since they must pay for both cellular telephone service and also for the web-enabling service for the PDA. This results in a very expensive alternative for the consumer.

The third alternative mentioned above is the use of web-phones or web-pagers. These devices suffer many of the same drawbacks as PDAs. First, these devices are expensive to purchase. Further, the number of web sites accessible to these devices is limited since web sites must be specifically designed to allow access by these devices. Furthermore, users are often required to pay an additional fee in order to gain wireless web access. Again, this service is expensive. Another drawback of these web-phones or web-pagers is that as technology develops, the methods used by the various web sites to allow access by these devices may change. These changes may require users to purchase new web-phones or web-pagers or have the current device serviced in order to upgrade the firmware or operating system stored within the device. At the least, this would be inconvenient to users and may actually be quite expensive.

Therefore, a need exists for a system that allows users to easily access and browse the Internet from any location. Such a system would only require users to have access to any type of telephone and would not require users to subscribe to multiple services.

In the rapidly changing area of Internet applications, web sites change frequently. The design of the web site may change, the information required by the web site in order to perform searches may change, and the method of reporting search results may change. Web browsing applications that submit search requests and interpret responses from these web sites based upon expected formats will produce errors and useless responses when such changes occur. Therefore, a need exists for a system that can detect modifications to web sites and adapt to such changes in order to quickly and accurately provide the information requested by a user through a voice enabled device, such as a telephone.

When users access web sites using devices such as personal computers, delays in receiving responses are tolerated and are even expected, however, such delays are not expected when a user communicates with a telephone. Users expect communications over a telephone to occur immediately with a minimal amount of delay time. A user attempting to find information using a telephone expects immediate responses to his search requests. A system that introduces too much delay between the time a user makes a request and the time of response will not be tolerated by users and will lose its usefulness. Therefore, it is important that a voice browsing system that uses telephonic communications selects web sites that provide rapid responses since speed is an important factor for maintaining the system's desirability and usability. Therefore, a need exists for a system that accesses web sites based upon their speed of operation.

SUMMARY OF THE INVENTION

It is an object of an embodiment of the present invention to allow users to gather information from web sites by using voice enabled devices, such as wireline or wireless telephones.

An additional object of an embodiment of the present invention is to provide a system and method that allows the searching and retrieving of publicly available information by controlling a web browsing server using naturally spoken voice commands.

It is an object of another embodiment of the present invention to provide a robust voice browsing system that can obtain the same information from several web sites based upon a ranking order. The ranking order is automatically adjusted if the system detects that a given web site is not functioning, is too slow, or has been modified in such a way that the requested information cannot be retrieved any longer.

A still further object of an embodiment of the present invention is to allow users to gather information from web sites from any location where a telephonic connection can be made.

Another object of an embodiment of the present invention is to allows users to browse web sites on the Internet using conversational voice commands spoken into wireless or wireline telephones or other voice enabled devices.

An additional object an embodiment of the present invention is to provide a system and method for using voice commands to control and monitor devices connected to a network.

It is an object of an embodiment of the present invention to provide a system and method which allows devices connected to a network to be controlled by conversational voice commands spoken into any voice enabled device interconnected with the same network.

The present invention relates to a system for acquiring information from sources on a network, such as the Internet. A voice browsing system maintains a database containing a list of information sources, such as web sites, connected to a network. Each of the information sources is assigned a rank number which is listed in the database along with the record for the information source. In response to a speech command received from a user, a network interface system accesses the information source with the highest rank number in order to retrieve information requested by the user.

The a preferred embodiment of the present invention allows users to access and browse web sites when they do not have access to computers with Internet access. This is accomplished by providing a voice browsing system and method that allows users to browse web sites using conversational voice commands spoken into any type of voice enabled device (i.e., any type of wireline or wireless telephone, IP phone, wireless PDA, or other wireless device). These spoken commands are then converted into data messages by a speech recognition software engine running on a user interface system. These data messages are then sent to and processed by a network interface system. This network interface system then generates the proper requests that are transmitted to the desired web site over the Internet. Responses sent from the web site are received and processed by the network interface system and then converted into an audio message via a speech synthesis engine or a pre-recorded audio concatenation application and finally transmitted to the user's voice enabled device.

A preferred embodiment of the voice browser system and method uses a web site polling and ranking methodology that allows the system to detect changes in web sites and adapt to those changes in real-time. This enables the voice browser system of a preferred embodiment to deliver highly reliable information to users over any voice enabled device. This ranking system also enables the present invention to provide rapid responses to user requests. Long delays before receiving responses to requests are not tolerated by users of voice-based systems, such as telephones. When a user speaks into a telephone, an almost immediate response is expected. This expectation does not exist for non-voice communications, such as email transmissions or accessing a web site using a personal computer. In such situations, a reasonable amount of transmission delay is acceptable. The ranking system of implemented by a preferred embodiment of the present invention ensures users will always receive the fastest possible response to their request.

An alternative embodiment of the present invention allows users to control and monitor the operation of a variety of household devices connected to a network using speech commands spoken into a voice enabled device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a depiction of the voice browsing system of the first embodiment of the present invention;

FIG. **2** is a block diagram of a database record used by the first preferred embodiment of the present invention;

FIG. **3** is a block diagram of a media server used by the preferred embodiment;

FIG. **4** is a block diagram of a web browsing server used by the preferred embodiment; and

FIG. **5** is a depiction of the device browsing system of the second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A first embodiment of the present invention is a system and method for allowing users to browse information sources, such as web sites, by using naturally spoken, conversational voice commands spoken into a voice enabled device. Users are not required to learn a special language or command set in order to communicate with the voice browsing system of the present invention. Common and ordinary commands and phrases are all that is required for a user to operate the voice browsing system. The voice browsing system recognizes naturally spoken voice commands and is speaker-independent; it does not have to be trained to recognize the voice patterns of each individual user. Such speech recognition systems use phonemes to recognize spoken words and not predefined voice patterns.

The first embodiment allows users to select from various categories of information and to search those categories for desired data by using conversational voice commands. The voice browsing system of the first preferred embodiment includes a user interface system referred to as a media server. The media server contains a speech recognition software engine. This speech recognition engine is used to recognize natural, conversational voice commands spoken by the user and converts them into data messages based on the available recognition grammar. These data messages are then sent to a network interface system. In the first preferred embodiment, the network interface system is referred to as a web browsing server. The web browsing server then accesses the appropriate information source, such as a web site, to gather information requested by the user.

Responses received from the information sources are then transferred to the media server where speech synthesis engine converts the responses into audio messages that are transmitted to the user. A more detailed description of this embodiment will now be provided.

Referring to FIG. **1**, a database **100** designed by Webley Systems Incorporated is connected to one or more web browsing servers **102** as well as to one or more media servers **106**. The database may store information on magnetic media,

such as a hard disk drive, or it may store information via other widely acceptable methods for storing data, such as optical disks. The database **100** contains a separate set of records for each web site accessible by the system. An example of a web site record is shown in FIG. **2**. Each web site record **200** contains the rank number of the web site **202**, the associated Uniform Resource Locator (URL) **204**, and a command that enables the appropriate "extraction agent" **206** that is required in order to generate proper requests sent to and to format data received from the web site. The database record **200** also contains the timestamp **208** indicating the last time the web site was accessed. The extraction agent is described in more detail below. The database **100** categorizes each database record **200** according to the type of information provided by each web site. For instance, a first category of database records **200** may correspond to web sites that provide "weather" information. The database **100** may also contain a second category of records **200** for web sites that provide "stock" information. These categories may be further divided into subcategories. For instance, the "weather" category may contain subcategories depending upon type of weather information available to a user, such as "current weather" or "extended forecast". Within the "extended forecast" subcategory, a list of web site records may be stored that provide weather information for multiple days. The use of subcategories may allow the web browsing feature to provide more accurate, relevant, and up-to-date information to the user by accessing the most relevant web site. The number of records contained in each category or subcategory is not limited. In the preferred embodiment, three web site records are provided for each category.

Table 1 below depicts two database records **200** that are used with the preferred embodiment. These records also contain a field indicating the "category" of the record, which is "weather" in each of these examples.

TABLE 1

```
category:    weather
URL: URL=http: //cgi .cnn.com/cgi-
bin/weather/redirect? zip= zip
rank: 1
command:  web_dispatch .pl weather_cnn
browsingserver:       wportal1
browsingServerBackup:    wportal2
dateTime:   Dec 21 2000 2:15PM
category:    weather
URL: URL=http: //weather.lycos.com/wcfiveday.asp?city=zip
rank:        2
command:  web_dispatch.pl weather_lycos
browsingServer:       wportal1
browsingserverBackup:    wportal2
dateTime:   Dec 21 2000 1:45PM
```

The database also contains a listing of pre-recorded audio files used to create concatenated phrases and sentences. Further, database **100** may contain customer profile information, system activity reports, and any other data or software servers necessary for the testing or administration of the voice browsing system.

The operation of the media servers **106** will now be discussed in relation to FIG. **3**. The media servers **106** function as user interface systems. In the preferred embodiment, the media servers **106** contain a speech recognition engine **300**, a speech synthesis engine **302**, an Interactive Voice Response (IVR) application **304**, a call processing system **306**, and telephony and voice hardware **308** required to communicate with the Public Switched Telephone Network (PSTN) **116**. In the preferred embodiment, each media server is based upon Intel's Dual Pentium III 730 MHz microprocessor system.

The speech recognition function is performed by a speech recognition engine **300** that converts voice commands received from the user's voice enabled device **112** (i.e., any type of wireline or wireless telephone, Internet Protocol (IP) phones, or other special wireless units) into data messages. In the preferred embodiment, voice commands and audio messages are transmitted using the PSTN **116** and data is transmitted using the TCP/IP communications protocol. However, one skilled in the art would recognize that other transmission protocols may be used for either voice or data. Other possible transmission protocols would include SIP/VoIP (Session Initiation Protocol/Voice over IP), Asynchronous Transfer Mode (ATM) and Frame Relay. A preferred speech recognition engine is developed by Nuance Communications of 1380 Willow Road, Menlo Park, Calif. 94025 (www.nuance.com). The Nuance engine capacity is measured in recognition units based on CPU type as defined in the vendor specification. The natural speech recognition grammars (i.e., what a user can say that will be recognized by the speech recognition engine) were developed by Webley Systems.

Table 2 below provides a partial source code listing of the recognition grammars used by the speech recognition engine of the preferred embodiment for obtaining weather information.

TABLE 2

```
?WHAT_IS ?the weather ?[info information report conditions]
        ? ( (?like in )
        ]
    UScities:n
        {<paraml $n.zip> <param2 $n.city> <param3
        $n.state>}
        ( (area code) AREA_CODE:n ) {<paraml $n>}
        ( AREA_CODE:n (area code) ) {<paraml $n>}
        ( (zip ?code) ZIP_CODE:n ) {<paraml $n>}
        ( ZIP_CODE:n (zip ?code) ) {<paraml $n>}
        ]
        )
            ) {<menu 194>}
```

The media server **106** uses recognition results generated by the speech recognition engine **300** to retrieve a web site record **200** stored in the database **100** that can provide the information requested by the user. The media server **106** processes the recognition result data identifying keywords that are used to search the web site records **200** contained in the database **100**. For instance, if the user's request was "What is the weather in Chicago?", the keywords "weather" and "Chicago" would be recognized. A web site record **200** with the highest rank number from the "weather" category within the database **100** would then be selected and transmitted to the web browsing server **102** along with an identifier indicating that Chicago weather is being requested.

The media servers **106** also contain a speech synthesis engine **302** that converts the data retrieved by the web browsing servers **102** into audio messages that are transmitted to the user's voice enabled device **112**. A preferred speech synthesis engine is developed by Lernout and Hauspie Speech Products, 52 Third Avenue, Burlington, Mass. 01803 (www.lhsl.com).

A further description of the web browsing server **102** will be provided in relation to FIG. **4**. The web browsing servers **102** provide access to any computer network such as the Internet **110**. These servers are also capable of accessing databases stored on Local Area Networks (LANs) or Wide Area Networks (WANs). The web browsing servers receive

responses from web sites and extract the data requested by the user. This task is also known as "content extraction." The web browsing servers **102** also perform the task of periodically polling or "pinging" various web sites and modifying the ranking numbers of these web sites depending upon their response and speed. This polling feature is further discussed below. The web browsing server **102** is comprised of a content extraction agent **400**, a content fetcher **402**, a polling and ranking agent **404**, and the content descriptor files **406**. Each of these are software applications and will be discussed below.

Upon receiving a web site record **200** from the database **100** in response to a user request, the web browsing server **102** invokes the "content extraction agent" command **206** contained in the record **200**. The content extraction agent **400** allows the web browsing server **102** to properly format requests and read responses provided by the web site **114** identified in the URL field **204** of the web site record **200**. Each content extraction agent command **206** invokes the content extraction agent and identifies a content description file associated with the web page identified by the URL **204**. This content description the directs the extraction agent where to extract data from the accessed web page and how to format a response to the user utilizing that data. For example, the content description for a web page providing weather information would indicate where to insert the "city" name or ZIP code in order to retrieve Chicago weather information. Additionally, the content description file for each supported URL indicates the location on the web page where the response information is provided. The extraction agent **400** uses this information to properly extract from the web page the information requested by the user.

Table 3 below contains source code for a content extraction agent **400** used by the preferred embodiment.

TABLE 3

```
#! /usr/local/www/bin/sybper15
#$Header:
/usr/local/cvsroot/webley/agents/service/web_dispatch.pl, v
1.6
# Dispatches all web requests
#http://wcorp.itn.net/cgi/flstat?carrier=ua&flightno=155&mo
nabbr=jul&date=
6&stamp=OhLN~PdbuuE*itn/ord, itn/cb/sprint_hd
#http://cgi.cnnfn.com/flightview/rlm?airline=amt&number=300
require "config_tmp.pl";
# check parameters
die "Usage: $0 service [params]\n" if $#ARGV < 1;
#print STDERR @ARGV;
* get parameters
my ( $service, @param ) = @ARGV;
# check service
my %Services = (
                    weather_cnn => 'webget.pl weather_cnn',
                    weather lycos => 'webget.pl
weather lycos',
                    weather_weather => 'webget.pl
weather_weather',
                    weather_snap => 'webget.pl
weather_snap',
                    weather_infospace => 'webget.pl
weather_infospace',
                    stockQuote_yahoo => 'webget.pl stock',
                    flightstatusitn => 'webget.pl
flight_delay',
                    yellowPages_yahoo => 'yp_data.pl',
                    yellowPages_yahoo => 'yp_data.pl',
                    newsHeaders_newsreal => 'news.pl',
                    newsArticle_newsreal => 'news.pl',
# test param
my $date = 'date';
chop ( $date );
```


TABLE 3-continued

```
my ( $short_date ) = $date =~ /\s+(\w{3}\s+\d{1,2})\s+/;
my %Test = (
                    weather_cnn => '60053',
                    weather lycos => '60053',
                    weather_weather => '60053',
                    weather_snap => '60053',
                    weather_infospace => '60053',
                    stockQuote_yahoo => 'msft',
                    flightStatus_itn => 'ua 155 '.
$ short_date,
                    yellowPages_yahoo => 'tires 60015',
                    newsHeaders_newsreal => '1',
                    newsArticle_newsreal => '1 1',
die "$date: $0: error: no such service: $service (check this
script) \n"
unless $Services {$service };
# prepare absolute path to run other scripts
my ( $path, $script ) = $0 =~ m|(.*/) ([ /]*)|;
# store the service to compare against datatable
my $service_stored = $service;
# run service
while( !( $response = '$path$Services{$service }@param' ) )
{
        # response failed
        # check with test parameters
        $response = '$path$Services{$service }$Test{$service
}';
#       print "test: $path$Services{$service }$Test{$service
}";
        if ( $response ) {
            $service = &switch_service ( $service );
#           print "Wrong parameter values were supplied:
$service -
@param\n";
#           die "$date: $0: error: wrong parameters: $service
-
@param\n";
        }
        else {
            # change priority and notify
            $service = &increase_attempt( $service );
        }
}
# output the response
print $response;
sub increase_attempt {
        my ( $service ) = @_;
        my ( $service_name ) = split ( /_/, $service );
        print STDERR "$date: $0: attn: changing priority for
service:
$service\n";
        # update priority
        &db_query( "update mcServiceRoute "
                    . "set priority = ( select max( priority )
from
mcServiceRoute
                    . "where service = '$service_name' ) + 1,
"
                    . "date = getdate( ), "
                    . "attempt = attempt + 1 "
                    . "where route = '$script $service'" );
#       print "---$route===\n";
        # find new route
        my $route = @{&db_query( "select route from
mcServiceRoute "
                        . "where service =
'$service name'
                        . "and attempt < 5
"
                        . "order by
priority ")
                        }-> [ 0 ]{route };
        &db_query( "update mcServiceRoute "
                    . "set attempt = 0 "
                    . "where route = '$script $service'"
            if ( $route eq "$script $service"
                or $route eq "$script $service_stored" );
        ( $service_name, $service ) = split( /\s+/, $route );
        die "$date: $0: error: no route for the service:
$service (add
```

TABLE 3-continued

```
more) \n"
                unless $service;
        return $service;
}
sub switch_service {
        my ( $service ) = @_;
        my ( $service_name ) = split( /_/, $service );
        print STDERR "$date: $0: attn: changing priority for
service:
$service\n";
        # update priority
        &db_query( "update mcServiceRoute "
                        . "set priority = ( select max ( priority )
from
mcServiceRoute "
                        . "where service = '$service_name' ) + 1,
"
                        . "date = getdate( ) "
                        "where route = '$script $service'" );
#       print "---$route===\n";
        # find new route
        my $route = @{&db_query( "select route from
mcServiceRoute "
```

TABLE 3-continued

```
                        . "where service =
'$service name' "
                        . "and attempt < 5
"
                        . "order by
priority ")
                                }-> 1 0 ){route };
        die "$date: $0: error: there is the only service:
$route (add
more) \n"
                if ( $route eq "$script $service"
                        or $route eq "$script $service_stored" );
        ( $service name, $service ) = split( /\s+/, $route );
        die "$date: $0: error: no route for the service:
$service (add
more) \n"
                unless $service;
        return $service;
}       __
```

Table 4 below contains source code of the content fetcher **402** used with the content extraction agent **400** to retrieve information from a web site.

TABLE 4

```
#! /usr/local/www/bin/sybperls
#-T
#    -w
#    $Header:
/usr/local/cvsroot/webley/agents/service/webget .pl,v 1.4
# Agent to get info from the web.
# Parameters: service_name Eservice_parameters] , i.e. stock
msft or weather
60645
# configuration stored in files service_name.ini
# if this file is absent the configuration is received from
mcServices table
# This script provides autoupdate to datatable if the .ini
file is newer.
$debug = 1;
use URI::URL;
use LWP::User Agent;
use HTTP::Request::Common;
use Vail::VarList;
use Sybase::CTlib;
use HTTP::cookies;
#print "Sybase::CTlib $DB_USR, $DB_PWD, $DB_SRV;";
open( STDERR, ">>$0.log" ) if $debug;
#open( STDERR, ">&STDOUT" );
$log = 'date';
#$response = './url.pl "http://cgi.cnn.com/cgi-bin/weather/redirect?zip=60605"';
#$response = 'pwd';
#print STDERR "pwd = $response\n";
#$response = 'ls';
#print STDERR "is = $response\n";
chop( $log );
$log .= "pwd=" . 'pwd';
chop( $log );
#$debug2 = 1;
my $service = shift;
$log .= " $service: ". join( ':', @ARGV ) . "\n";
print STDERR $log if $debug;
#$response = './url.pl
"http://cgi.cnn.com/cgi-bin/weather/redirect?zip=60605"';
my @ini = &read_ini ( $service );
chop( @ini );
my $section = "";
do {$section = &process_section( $section ) } while $section;
#$response = './url.pi
"http://cgi.cnn.com/cgi-bin/weather/redirect'izip=60605"';
exit;
sub read_ini {
        my ( $service ) = my @ini = 0;
        # first, try to read file
        $0 =~ m|^ (.*/) [^//]*|;
        $service = $1 . $service;
        if ( open( INI, "$service.ini" ) ) {
```

TABLE 4-continued

```
                    @ini = ( <INI> );
                    return @ini unless ( $DB_SRV);
                    # update datatable
                    my $file_time = time – int( ( -M "$service.ini" )
* 24 *
3600 )
#                   print "time $file_time\n";
                    my $dbh = new Sybase::CTlib $DB_USR, $DB_PWD,
$DB_SRV;
                    unless ( $dbh ) {
                        print STDERR "webget.pl: Cannot connect to
dataserver $DB_SRV:$DB_USR:$DB_PWD\n";
                        return @ini;
                    }
                    my @row_refs = $dbh–>ct_sql( "select lastUpdate
from
mcServices where service = '$service'", undef, 1 );
                    if ( $dbh–>{Rc }== cs_FAIL ) {
                        print STDERR "webget.pl: DB select from
mcServices
failed\n";
                        return @ini;
                    }
                    unless ( defined @row_refs ) {
                        # have to insert
                        my ( @ini_escaped ) = map {
                            ( my $x = $_ ) =~ } s/\'/\'\'/g
                        $dbh–>ct_sql("insert mcServices values(
'$service'
'@ini_escaped', $file_time ) ');
                        if ( $dbh–>{Rc }== CS_FAIL ) {
                            print STDERR "webget.pl: DB insert to
mcServices failed\n";
                        }
                        return @ini;
                    }
#                   print "time $file_time:".$row_refs [ 0 ]–
> {' lastUpdate'
} . " \n"
                    if ( $file_time > $row_refs [ 0 ] –> {'lastUpdate' })
{
                        # have to update
                        my ( @ini_escaped ) = map {
                            ( my $x = $_ ) =~ s/\'/\'\'/g;
                            $x;
                        }@ini;
                        $dbh–>ct_sql( "update mcServices set config =
'@ini_escaped', lastUpdate = $file_time where service =
'$service'" );
                        if ( $dbh–>{RC }== CS_FAIL ) {
                            print STDERR "webget.pl: DB update to
mcServices failed\n";
                        }
                    }
                    return @ini;
                }
                else {
                    print STDERR "$0: WARNING: $service.ini n/a in " .
'pwd'
                        . "Try to read DB\n";
                }
                # then try to read datatable
                die "webget.pl: Unable to find service $service\n"
unless ( $DB_SRV
);
                my $dbh = new Sybase::CTlib $DB_USR, $DB_PWD, $DB_SRV;
                die "webget.pl: Cannot connect to dataserver
$DB_SRV:$DB_USR:$DB_PWD\n" unless ( $dbh );
                my @row_refs = $dbh–>ct_sql( "select config from
mcServices where
service = '$service'", undef, 1 );
                die "webget.pl: DB select from mcServices failed\n" if
$dbh–>{RC }
== CS_FAIL;
```

TABLE 4-continued

```
                die "webget.pl: Unable to find service $service\n"
unless ( defined
@row_refs );
                $row_refs [ 0 ]->{'config' }=--- s/\n /\n\r/g;
                @ini = split( /\r/, $row_refs [ 0 ] ->{'config' });
                return @ini;
}    -
##############################################
sub process_section {
                my ( $prev_section ) = my ( $section, $output, $content );
                my %Param;
                my %content;
#               print "###################################\n";
                foreach ( @ini ) {
#               print;
#               chop;
                s/\s+$//;
                s/^\s+//;
                # get section name
                if( /~\[(.* )\]/) {
#                       print "$_: $section:$prev_section\n";
                        last if $section;
                        next if $1 eq "print";
#                       next if $prev_section ne '' and $prev_section
ne$1;
                        if ( $prev_section eq $1 ) {
                                $prev_section = "";
                                next;
                        }
                        $section $1;
                }
                # get parameters
                push( @{$Param{$1 }}, $2 ) if $section and
/([^=]+)=(.*)/;
                }
#               print"++++++++++++++++++++++++++++++++++++++\n";
                return 0 unless $section;
#               print "section $section\n";
                # substitute parameters with values
                map {$Param{URL }->[ 0 ] =- s/$Param{Input }->[ $_
]/$ARGV[ $_
]/g
                }0 .. $#{$Param{Input }};
                # get page content
                ( $content{'TIME' }, $content ) = &geturlcontent(
${$Param{URL
}}[ 0] );
                # filter it
                map {
                        if ( /\" ( [^\"] +)\"([^\"]*)\"/ or
/\/([^\/]+)\/([^\/*)\// )
{
                                my $out = $2; $content =--- s/$1/$out/g;
                        }
                }@{$Param{"Pre-filter" }};
#print STDERR $content;
                # do main regular expression
                unless( @values = $content =~
/${$Param{Regular_expression }} [ 0
]/ ) {
                        &die_hard( ${$Param{Regular_expression }} [ 0 ],
$content
);
                        return $section;
                }
                %content = map {( $Param(Output }->[ $_ ], $values[ $_
])
                }0 .. $*{$Param {Output }};
                # filter it
                map {
                        if ( / ( [^\"] +) \" ([^\"] +) \"([^\ "]*) \"/
                                or / ( [ \/] +) \/ ( [ \/] +) \/ ( ( \/] *) \// ) {
                                my $out = $3;
                                $content{$1 }=~ s/$2/$out/g;
                        }
                }@{$Param{"Post-filter" }};
                # calculate it
                map
                        if( /([^=]+)=(.*)/ ) {
                                my $eval = $2;
```

TABLE 4-continued

```
                        map {$eval =~ s/$/$Content{$ }/g
                        }keys %Content;
                    $content{$1 }= eval( $eval );
                }
            }@{$Param{Calculate }};
            # read section [print]
            foreach $i ( 0 . . $*ini ) {
                next unless $ini[ $i ] =~ /^\[.+\]/;
                foreach ( $i + 1 . . $#ini ) {
                    last if $ini[ $_ ]=~ /^\[.+\]/;
                    $output .= $ini[ $_ ] . "\n";
                }
                last;
            }
            # prepare output
            map {$output =~ s/$_/$Content{$_ }/g
            }keys %Content;
            print $output;
            return 0;
}
##############################################
sub get_url content {
            my ( $url ) = @_;
            print STDERR $url if $debug;
#           $response = `./url.pl "$url"`;
            $response = `./url.pl "$url"`;
            return( $time - time, $response );
            my $ua = LWP::UserAgent->new;
            $ua->agent( 'Mozilla/4.0 [en] (X11; I; FreeBSD 2.2.8-
STABLE i386)'
);
#           ua->proxy( ['http', 'https'],
'http://proxy.webley:3128/' );
#           $ua->no_proxy( 'webley', 'vail' );
            my $cookie = HTTP::Cookies->new;
            $ua->cookie_jar( $cookie );
            $url = url $url;
            print "$unl\n" if $debug2;
            my $time = time;
            my $res = $ua->request( GET $uri );
            print "Response: " . ( time - $time ) . "sec\n" if
$debug2;
            return( $time - time, $res->content );
}
##############################################
sub die_hard {
            my( $re, $content ) =
            my ( $re_end, $pattern );
            while( $content /$re/ ) {
                if ( $re =- s/ (\ ( [^\ (\) ] +\) [^\ (\)] *$)// ) }
                    $re end = $1 . $re end;
                }
                else {
                    $re_end = $re;
                    last;
                }
            }
            $content =~ /$re/;
            print STDERR "The regular expression did not match:\n
$ re\n
Possible misuse:
$re_end: \n
Matched:
$&\n
Mismatched:
$'\n
" if $debug;
                if ( $debug) {
                    print STDERR "Content:\n $content\n" unless
$';
                }
}
##############################################
```

Table 5 below contains the content descriptor file source code for obtaining weather information from the web site www.cnn.com that is used by the extraction agent **400** of the preferred embodiment.

TABLE 5

```
[cnn]
Input=_zip
URL=http: //cgi .cnn.com/cgi-bin/weather/redinect?zip= zip
Pre-filter="\n"
Pre-filter="<[^<>]+>""
Pre-filter=/\s+/ /
Pre-filter=" (\(\)\|]"!"
Output=_location
Output=first_day_name
Output=first_day_weather
Output=first_day_high_F
Output=first_day_high_c
Output=first_day_low_F
Output=first_day_low_c
Output=second_day_name
Output=second_day_weather
Output=second_day_high_F
Output=second_day_high_c
Output=second_day_low_F
Output=second_day_low_c
Output=third_day_name
Output=third_day_weather
Output=third_day_high_F
Output=third_day_high_c
Output=thind_day_low_F
Output=thind_day_low_c
Output=fourth_day_name
Output=fourth_day_weather
Output=fourth_day_high_F
Output=fourth_day_high_c
Output=fourth_day_low_F
Output=fourth_day_low_c
Output=undef
Output=_cunrent_time
Output=_current_month
Output=_current_day
Output=_current_weather
Output=_current_tempenature_F
Output=_current_temperature_c
Output=_humidity
Output=_wind
Output=_pressure
Output=_sunrise
Output=_sunset
Regular expression=Author   (.+) Four Day Forecast
(\S+) (\S+) HIGH
(\s+) F (\S+) C LOW (\S+) F (\S+) C (\S+) (\S+) HIGH (\S+) F
(\S+) C LOW
(\S+) F (\S+) C (\S+) (\S+) HIGH (\S+) F (\S+) C LOW (\S+) F
(\S+) C (\S+)
(\S+) HIGH (\S+) F (\S+) C LOW (\S+) F (\S+) C (.+) Current
Conditions(.+)
!local!, (\S+) (\S+) (.+) Temp: (\S+) F, (\S+) C Rel.
Humidity:  (\S+) Wind:
(.+) Pressure: (.+) Sunrise: (.+) Sunset: (.+) Related Links
Post-filter=_current_weather"p/"partly"
Post-filter=_current_weather" l/"little"
Post-filter=_current_weather"m/"mostly"
Post-filter=_current_weathen"t-/"thunder"
Post-filter=_wind"N"North"
Post-filter=_wind"E"East"
Post-filter=_wind"s"South"
Post-filter=_wind"W"West"
Post-filter=_wind/mph/miles per hour/
Post-filter=_wind/kph! /kilometers per hour/
Post-filter=_wind"\s+!"","
[print]
Current weather in _location is _current_weather.
Temperature is _current_temperature_F Fahrenheit,
_current_temperature_C
Celsius.
Humidity is _humidity.
Wind from the _wind.
```


Table 6 below contains the content descriptor file source code for obtaining weather information from the web site www.lycos.com that is used by the extraction agent **400** of the preferred embodiment.

TABLE 6

```
[lycos]
Input=zip
Input=_city
URL=http://weather.lycos.com/wcfiveday.asp?city=zip
Pre-filter="\n"
Pne-filter="</TD>"td"
Pre-filter="<! .*?_>""
Pre-filter="<br>" br_"
Pre-filter=/alt"/>alt=/
Pre-filter="<[^<>]+>""
Pre-filter=" "
Pre-filter=/\s+/ /
Output=_location
Output=_current_weather
Output=_current_temperature_F
Output=_humidity
Output=_winddir
Output=_windspeed
Output=_windmeasure
Output=_pressure
Output=finst_day_name
Output=second_day_name
Output=thind_day_name
Output=fourth_day_name
Output=fifth_day_name
Output=first_day_weather
Output=second_day_weather
Output=third_day_weather
Output=founth_day_weather
Output=fifth_day_weather
Output=first_day_high_F
Output=first_day_low_F
Output=second_day_high_F
Output=second_day_low_F
Output=thind_day_high_F
Output=third_day_low_F
Output =fourth_day_high_F
Output=fourth_day_low_F
Output=fifth_day_high_F
Output=fifth_day_low_F
Output=_windkmh
Regular expression=Guide My Lycos (.+) Click image to
enlarge
alt=([^"]+)"(?:.+) Temp: (\d+)(?:.+)F_br_Humidity:
(\S+) (?:.+) Wind:
_br_
Output =_current_temperature_C
Post-filter=_location"_br_"
Post-filter=_current_weather"p/"partly"
Post-filter=_current_weather"m/"mostly"
Post-filter=_current_weather"t-/"thunder"
Post-filter=_winddir"@" at"
Post-filter=_winddir/mph/miles pen hour/
Post-filter=_wind/kph!/kilometens per hour/
Calculate=_current_temperature_C=int ( (_current_temperature_F
−32) *5/9)
Calculate=_windkmh=int (_windspeed*1.6)
[print]
The current weather in _location is _current_weather.
The current temperature is _current_temperature_F Fanenheit
_curnent_temperatune_C Celsius.
Humidity is _humidity.
Winds _winddir.
```

Once the web browsing server **102** accesses the web site specified in the URL **204** and retrieves the requested information, the information is forwarded to the media server **106**. The media server uses the speech synthesis engine **302** to create an audio message that is then transmitted to the user's voice enabled device **112**. In the preferred embodiment, each web browsing server **102** is based upon Intel's Dual Pentium III 730 MHz microprocessor system.

Referring to FIG. **1**, the operation of the robust voice browser system will be described. A user establishes a connection between his voice enabled device **112** and a media server **106**. This may be done using the Public Switched Telephone Network (PSTN) **116** by calling a telephone number associated with the voice browsing system **118**. Once the connection is established, the media server **106** initiates an interactive voice response (WR) application **304**. The IVR application plays audio messages to the user presenting a list of options, such as, "stock quotes", "flight status", "yellow pages", "weather", and "news". These options are based upon the available web site categories and may be modified as desired. The user selects the desired option by speaking the name of the option into the voice enabled device **112**.

As an example, if a user wishes to obtain restaurant information, he may speak into his telephone the phrase "yellow pages". The FIR application would then ask the user what he would like to find and the user may respond by stating "restaurants". The user may then be provided with further options related to searching for the desired restaurant. For instance, the user may be provided with the following restaurant options, "Mexican Restaurants", "Italian Restaurants", or "American Restaurants". The user then speaks into the telephone **112** the restaurant type of interest. The IVR application running on the media server **106** may also request additional information limiting the geographic scope of the restaurants to be reported to the user. For instance, the IVR application may ask the user to identify the zip code of the area where the restaurant should be located. The media server **106** uses the speech recognition engine **300** to interpret the speech commands received from the user. Based upon these commands, the media server **106** retrieves the appropriate web site record **200** from the database **100**. This record and any additional data, which may include other necessary parameters needed to perform the user's request, are transmitted to a web browsing server **102**. A firewall **104** may be provided that separates the web browsing server **102** from the database **100** and media server **106**. The firewall provides protection to the media server and database by preventing unauthorized access in the event the firewall for web browsing server **108** fails or is compromised. Any type of firewall protection technique commonly known to one skilled in the art could be used, including packet filter, proxy server, application gateway, or circuit-level gateway techniques.

The web browsing server **102** then uses the web site record and any additional data and executes the extraction agent **400** and relevant content descriptor file **406** to retrieve the requested information.

The information received from the responding web site **114** is then processed by the web browsing server **102** according to the content descriptor file **406** retrieval by the extraction agent. This processed response is then transmitted to the media server **106** for conversion into audio messages using either the speech synthesis software **302** or selecting among a database of prerecorded voice responses contained within the database **100**.

As mentioned above, each web site record contains a rank number **202** as shown in FIG. **2**. For each category searchable by a user, the database **100** may list several web sites, each with a different rank number **202**. As an example, three different web sites may be listed as searchable under the category of "restaurants". Each of those web sites will be assigned a rank number such as 1, 2, or 3. The site with the highest rank (i.e., rank=1) will be the first web site accessed by a web browsing server **102**. If the information requested by the user cannot be found at this first web site, then the web browsing server **102** will search the second ranked web site and so forth down the line until the requested information is retrieved or no more web sites left to check.

The web site ranking method and system of the present invention provides robustness to the voice browser system and enables it to adapt to changes that may occur as web sites evolve. For instance, the information required by a web site **114** to perform a search or the format of the reported response data may change. Without the ability to adequately monitor and detect these changes, a search requested by a user may provide an incomplete response, no response, or an error. Such useless responses may result from incomplete data being provided to the web site **114** or the web browsing server **102** being unable to recognize the response data messages received from the searched web site **114**.

The robustness and reliability of the voice browsing system of the present invention is further improved by the addition of a polling mechanism. This polling mechanism continually polls or "pings" each of the sites listed in the database **100**. During this polling function, a web browsing server **102** sends brief data requests or "polling digital data" to each web site listed in database **100**. The web browsing server **102** monitors the response received from each web site and determines whether it is a complete response and whether the response is in the expected format specified by the content descriptor file **406** used by the extraction agent **400**. The polled web sites that provide complete responses in the format expected by the extraction agent **400** have their ranking established based on their "response lime". That is, web sites with faster response times will be will be assigned higher rankings than those with slower response times. If the web browsing server **102** receives no response from the polled web site or if the response received is not in the expected format, then the rank of that web site is lowered. Additionally, the web browsing server contains a warning mechanism that generates a warning message or alarm for the system administrator indicating that the specified web site has been modified or is not responsive and requires further review.

Since the web browsing servers **102** access web sites based upon their ranking number, only those web sites that produce useful and error-free responses will be used by the voice browser system to gather information requested by the user. Further, since the ranking numbers are also based upon the speed of a web site in providing responses, only the most time efficient sites are accessed. This system assures that users will get complete, timely, and relevant responses to their requests. Without this feature, users may be provided with information that is not relevant to their request or may not get any information at all. The constant polling and re-ranking of the web sites used within each category allows the voice browser of the present invention to operate efficiently. Finally, it allows the voice browser system of the present invention to dynamically adapt to changes in the rapidly evolving web sites that exist on the Internet.

It should be noted that the web sites accessible by the voice browser of the preferred embodiment may use any type of mark-up language, including Extensible Markup Language (XML), Wireless Markup Language (WML), Handheld Device Markup Language (HDML), Hyper Text Markup Language (HTML), or any variation of these languages.

A second embodiment of the present invention is depicted in FIG. **5**. This embodiment provides a system and method for controlling a variety of devices **500** connected to a network **502** by using conversational speech commands spoken into a voice enabled device **504** (i.e., wireline or wireless telephones, Internet Protocol (IP) phones, or other special wireless units). The networked devices may include various household devices. For instance, voice commands may be

used to control household security systems, VCRs, TVs, outdoor or indoor lighting, sprinklers, or heating and air conditioning systems.

Each of these devices **500** is connected to a network **502**. These devices **500** may contain embedded microprocessors or may be connected to other computer equipment that allow the device **500** to communicate with network **502**. In the preferred embodiment, the devices **500** appear as "web sites" connected to the network **502**. This allows a network interface system, such as a device browsing server **506**, a database **508**, and a user interface system, such as a media server **510**, to operate similar to the web browsing server **102**, database **100** and media server **106** described in the first preferred embodiment above. A network **502** interfaces with one or more network interface systems, which are shown as device browsing servers **506** in FIG. **5**. The device browsing servers perform many of the same functions and operate in much the same way as the web browsing servers **102** discuss above in the first preferred embodiment. The device browsing servers **506** are also connected to a database **508**.

Database **508** lists all devices that are connected to the network **502**. For each device **500**, the database **508** contains a record similar to that shown in FIG. **2**. Each record will contain at least a device identifier, which may be in the form of a URL, and a command to "content extraction agent" contained in the device browsing server **506**. Database **508** may also include any other data or software necessary to test and administer the device browsing system.

The content extraction agent operates similarly to that described in the first embodiment. A device descriptor file contains a listing of the options and functions available for each of the devices **500** connected on the network **502**. Furthermore, the device descriptor file contains the information necessary to properly communicate with the networked devices **500**. Such information would include, for example, communication protocols, message formatting requirements, and required operating parameters.

The device browsing server **506** receives messages from the various networked devices **500**, appropriately formats those messages and transmits them to one or more media servers **510** which are part of the device browsing system. The user's voice enabled devices **504** can access the device browsing system by calling into a media server **510** via the Public Switched Telephone Network (PSTN) **512**. In the preferred embodiment, the device browsing server is based upon Intel's Dual Pentium III 730 MHz microprocessor system.

The media servers **510** act as user interface systems and perform the functions of natural speech recognition, speech synthesis, data processing, and call handling. The media server **510** operates similarly to the media server **106** depicted in FIG. **3**. When data is received from the device browser server **506**, the media server **510** will convert the data into audio messages via a speech synthesis engine that are then transmitted to the voice enabled device of the user **504**. Speech commands received from the voice enabled device of the user **504** are converted into data messages via a speech recognition engine running on the media server **510**. A preferred speech recognition engine is developed by Nuance Communications of 1380 Willow Road, Menlo Park, Calif. 94025 (www.nuance.com). A preferred speech synthesis engine is developed by Lernout and Hauspie Speech Products, 52 Third Avenue, Burlington, Mass. 01803 (www.lhsl.com). The media servers **510** of the preferred embodiment are based on Intel's Dual Pentium III 730 MHz microprocessor system. A specific example for using the system and method of this embodiment of the invention will now be given.

First, a user may call into a media server **510** by dialing a telephone number associated with an established device browsing system. Once the user is connected, the IVR application of the media server **510** will provide the user with a list of available systems that may be monitored or controlled based upon information contained in database **508**.

For example, the user may be provided with the option to select "Home Systems" or "Office Systems". The user may then speak the command "access home systems". The media server **510** would then access the database **508** and provide the user with a listing of the home subsystems or devices **500** available on the network **502** for the user to monitor and control. For instance, the user may be given a listing of subsystems such as "Outdoor Lighting System", "Indoor Lighting System", "Security System", or "Heating and Air Conditioning System". The user may then select the indoor lighting subsystem by speaking the command "Indoor Lighting System". The IVR application would then provide the user with a set of options related to the indoor lighting system. For instance the media server **510** may then provide a listing such as "Dining Room", "Living Room", "Kitchen", or "Bedroom". After selecting the desired room, the IVR application would provide the user with the options to hear the "status" of the lighting in that room or to "turn on", "turn off", or "dim" the lighting in the desired room. These commands are provided by the user by speaking the desired command into the users voice enabled device **504**. The media server **510** receives this command and translates it into a data message. This data message is then forwarded to the device browsing server **506** which routes the message to the appropriate device **500**.

The device browsing system **514** of this embodiment of the present invention also provides the same robustness and reliability features described in the first embodiment. The device browsing system **514** has the ability to detect whether new devices have been added to the system or whether current devices are out-of-service. This robustness is achieved by periodically polling or "pinging" all devices **500** listed in database **508**. The device browsing server **506** periodically polls each device **500** and monitors the response. If the device browsing server **506** receives a recognized and expected response from the polled device, then the device is categorized as being recognized and in-service. However, if the device browsing server **506** does not receive a response from the polled device **500** or receives an unexpected response, then the device **500** is marked as being either new or out-of-service. A warning message or a report may then be generated for the user indicating that a new device has been detected or that an existing device is experiencing trouble.

Therefore, this embodiment allows users to remotely monitor and control any devices that are connected to a network, such as devices within a home or office. Furthermore, no special telecommunications equipment is required for users to remotely access the device browser system. Users may use any type of voice enabled device (i.e., wireline or wireless telephones, IP phones, or other wireless units) available to them. Furthermore, a user may perform these functions from anywhere without having to subscribe to additional services. Therefore, no additional expenses are incurred by the user.

The descriptions of the preferred embodiments described above are set forth for illustrative purposes and are not intended to limit the present invention in any manner. Equivalent approaches are intended to be included within the scope of the present invention. While the present invention has been described with reference to the particular embodiments illustrated, those skilled in the art will recognize that many

changes and variations may be made thereto without departing from the spirit and scope of the present invention. These embodiments and obvious variations thereof are contemplated as falling within the scope and spirit of the claimed invention.

What is claimed is:

1. A method for retrieving information from web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:

providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;

providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;

providing a speech command to said speaker-independent speech recognition engine,

said computer accessing at least one of a plurality of web sites associated with said speech command to obtain an information to be retrieved, said computer first accessing a first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;

said speech synthesis engine producing an audio message containing any retrieved information from said web sites; and

said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

2. The method of claim **1** wherein said speech command is further associated with a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

3. The method of claim **1** wherein said speech command is further associated with a ranking from highest to lowest associated with each said web site, said ranking indicating the order in which the plurality of web sites are accessed.

4. The method of claim **3** wherein said computer accesses said plurality of web sites based on said ranking, said computer first accessing said web site having the highest ranking.

5. The method of claim **4** further comprising the step of adjusting said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings.

6. The method of claim **1** further comprising the step of periodically polling each said web site to determine whether said web site contains said information to be retrieved.

7. The method of claim **6** wherein the computer periodically polls each said web site without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site, said computer creating a ranking of said plurality of web sites based on said periodic polling.

8. The method of claim **1** further comprising the step of periodically searching said internet to find new web sites containing said information to be retrieved, and adding said new web sites to said plurality of web sites.

9. A system for retrieving information from web sites by uttering speech commands into a phone and for providing to users retrieved information in an audio form via said phone, said system comprising:

a computer, said computer operatively connected to the internet and to at least one phone;

at least one speaker-independent speech recognition engine, said speaker-independent speech recognition engine operatively connected to said computer;

at least one speech synthesis engine, said speech synthesis engine operatively connected to said computer;

a database, said database operatively connected to said computer, said database containing a plurality of web site addresses;

a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved;

a ranking from highest to lowest associated with each said web site address, said ranking indicating the order in which the plurality of web sites are accessed;

said speaker-independent speech recognition engine configured to receive from users via said phone a speech command;

said computer configured to access at least one of said plurality of web sites associated with said speech command to obtain said information to be retrieved, said computer configured to first access said web site having the highest ranking and, if said information to be retrieved is not found at said web site having the highest ranking, said computer configured to subsequently access said plurality of web sites in order of rankings until said information to be retrieved is found or until said plurality of web sites has been accessed;

said computer further configured to establish or adjust said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings;

said speech synthesis engine configured to produce an audio message containing any retrieved information from said web sites, and said speech synthesis engine further configured to transmit said audio message to said users via said phone.

10. The system of claim **9** wherein said phone comprises a standard telephone, a cellular phone, or an IP phone.

11. The system of claim **9** wherein said internet is a local area network.

12. The system of claim **9** wherein said internet is a wide area network.

13. The system of claim **9** wherein said internet is the Internet.

14. The system of claim **9** wherein said computer is configured to establish or adjust said rankings associated with said plurality of web sites when instructed by said user to access said plurality of web sites to retrieve said information.

15. The system of claim **9** wherein said computer is configured to establish or adjust said rankings associated with said plurality of web sites based on periodic polling of each of said web sites without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site.

* * * * *

CERTIFICATE OF COMPLIANCE

I certify that the foregoing Brief for Parus Holdings, Inc.,

1. Complies with the type-volume limitation of FED. R. APP. P. 32(a)(7)(B). This brief contains 13,601 words, excluding the parts of the brief exempted by FED. R. APP. P. 5(c), 21(d), 27(d)(2), 32(f), and FED. CIR. R. 32(b). Microsoft Word was used to calculate the word count.

2. Complies with the typeface requirements of FED. R. APP. P. 32(a)(5) and the type style requirements of FED. R. APP. P. 32(a)(6). This brief has been prepared in a proportionally-spaced typeface using Microsoft Word in 14-point Times New Roman type style.

Dated: December 8, 2023

/s/ Joel L. Thollander
Joel L. Thollander